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# Editorial

## Basic Occupational Health Services – "Occupational Health for All"

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Occupational health is the area of medicine dedicated to the prevention and management of occupational and environmental injury, illness and disability, and the promotion of health and productivity of workers, their families and communities. Workers represent half the world's population and the major contributors to economic and social development. Their health is determined not only by workplace hazards but also by social and individual factors and access to health services[1].

Despite the availability of effective interventions to prevent occupational hazards and to protect and promote health at the workplace, large gaps exist between and within countries with regard to the health status of workers and their exposure to occupational risks. In spite of the fact that several authoritative bodies, like International Labour Organization (ILO), World Health Organization (WHO) and many other International and National bodies are working for worker's health, still only a small number (15-20%) of the global workforce has access to occupational health services[1]. According to ILO, over 2 million people die each year from occupationally related diseases and injuries. This is only the tip of the iceberg – another 160 million nonfatal diseases, and 270 million nonfatal injuries occur annually. Occupational diseases and injuries account for a loss of about 4% of the global gross domestic product[2].

In India, statistics for the overall incidence/prevalence of occupational disease and injuries for the country is not available. Leigh *et al*., have estimated an annual incidence of occupational disease between 924,700 - 1,902,300 and 121,000 deaths in India[3]. Based on the survey of agriculture injury incidence study by Mohan and Patel (1992) in Northern India, they estimated annual incidence of 17 million injuries per year, (2 million moderate to serious) and 53,000 deaths per year in agriculture alone[4].

In the field of occupational health, over the last few years a "double burden" of hazards has developed; the old hazards like silicosis, exposure to high levels of noise and (obsolete) chemicals and carrying heavy loads, go hand in hand with the newly emerged or recognized hazards, such as stress at work and long hours sitting in front of the computer screen. This double burden of hazards translates into a double burden of disease, making the panorama of occupational injuries and diseases complex[2].

Present Occupational health services focus mostly on the delivery of medical or curative services and on the provision of personal protective equipments, while the gain in health can be made mainly through (primary or primordial) prevention. At the same time, there has been a tendency worldwide to "blame the victim", focusing strongly on the change of behavior of workers, and making them responsible for accidents and diseases[2]. Globally, occupational health is in a difficult position as lack trained human resources in health promotion, insufficient finances or lack of will. In many countries, particularly in developing countries, there is a lack of policies and appropriate plans to protect the health and safety of workers.

The ILO convention, 161 on Occupational Health Services and the WHO global strategy on Occupational Health for All, demanding health for all working people of the world and the responsibility lies with organization[5].

In order to meet the global needs to develop occupational health services in the world the 13th joint ILO/WHO committee on occupational health in Dec–2003 decided to develop a new concept of – Basic Occupational Health Services (BOHS). The concept of BOHS is based on the concept of Primary Health Care as defined by the Alma Ata Declaration. The Basic Occupational Health Services can be defined as, an essential service for protection of people's health at work, for promotion of health, well-being and workability, as well as for prevention of ill-health and accidents[5].

The overall paradigm of BOHS emphasizes on four important elements Policy, Infrastructure, Good Practice and availability of Human Resources. The objective of Basic Occupational Health Services is to increase the global coverage of services and guide to appropriate content of services so that the occupational health needs of workers and workplaces in varying conditions prevailing in different parts of the world are met.

The ultimate objective of the BOHS is to ensure provision of services for all workplaces in the world (in both industrialized and developing countries). It is important to note that although the BOHS are intended to support meeting the basic needs of health and safety at work, the content of

services still is designed to comprise all the three elements protection, prevention and promotion[5].

**Stepwise Development of Infrastructure:**

The suggested model of OHS is discussed here. Every country should analyse its prevailing situation in OHS. On the basis of such analysis, a national policy and strategy including an action programme need to be drawn up. To consider the wide variation in the existing Occupational Health Services (OHS) in different countries a stepwise strategy is recommended. Depending on the degree of development achieved by the country, following levels of services are considered:

**Stage I: Starting Level :** For the workplace where there is no OHS at all, this is the starting point to start the services with the help of Occupational Health nurse and a safety person who should train in OHS. Focus of the services should be on severe health hazards and their prevention and control.

**Stage II : Basic Occupational Health Services (BOHS) :** This is an infrastructure based service which is working close to workplace. It includes a medical officer and a nurse – full time or part time depending on size of industry.

**Stage III : International Standard Services:** This type of services should be the objective of most of the countries, services are primarily preventive and also having curative component. This type of services provided by trained occupational health physician with multidisciplinary team.

**Stage IV : Comprehensive Occupational Health Services (COHS) :** This type of services are found in big companies of industrialized countries or large OHS centers. Staff includes multidisciplinary team like physician, occupational health nurse, occupational hygienist, ergonomist, psychologist, safety engineer, etc. The content of services is comprehensive covering all relevant aspects of occupational health[4,5].

Stage I and II are meant for smallest enterprises and informal sector of work where there is no OHS and there is not possibility to reach Stage III services which is the main goal to reach and fulfils the services as per ILO convention 161, 1995, insisting for preventive services.

The BOHS activities are described as a process starting from identification of occupational safety and health needs, going to surveillance of the work environment and workers' health, risk assessment, initiation of necessary preventive and control actions which have been recognized through risk assessment and proceeding to assistance in implementation of preventive and control actions and finally evaluation of the impact of actions[5,6].

The need for the development of occupational health services particularly for the working people and workplaces, which at present do not have access to services, is massive and urgent, even in India. The past experience of traditional instruments and totally voluntary activities have not provided such services, so novel and innovative approach of integrating Occupational Health in Primary Health Care system is very important and need of hour[5].

It is estimated that India has a working population of approximately 500 million. Less than 10% of the workforce is in organized sector, 60% self-employed and 30% do not have regular jobs. In India traditional public health concerns like communicable diseases, malnutrition, maternal & child health, poor environment and sanitation etc. get priorities in public health policies. But with recent industrialization and globalization newer pathologies like occupational morbidities, stress, cancers, psychological diseases and heart diseases are on rising trend. Increasing proportion of female in the workforce adds to the traditional Occupational problems. The changing face of service sector, in view of the exponential growth on account of globalization and increasing use of information technology, is expected to present new challenges to OHS[7]. In 2002, the National Commission on Labour has formulated a draft of OSH (Occupational Safety and Health) Bill 2002. The Bill has objective to incorporate a well-coordinated approach to safety and health which covering all sectors o the economy. The Act has general applicability to all worksites irrespective of number of employees and type of industry, including unorganised sectors like construction and agriculture[8]. But the Bill never comes on the floor for discussion and still waiting for enforcement.

The second important aspect of issue is the diagnosis and reporting of occupational diseases which is necessary to achieve and implement BOHS. As we aware that the statistics on accidents and occupational illnesses are very much under reported in country. The organized sector, both private and public, has basic level OH services available with the enforcement of the Factory Act. But in unorganized sector where the majority of workforce is working, OHS is still non-existent[7].

In India, The director general of the Factory Advisory Services and Labour Institutes deals with the safety and health of workers employed in factories and ports, whereas, the director general of Mines Safety deals with the safety and health of miners. There is a National Institute of Occupational Health (NIOH), Ahmedabad and two Regional Institute of Occupational Health providing speciality services and research in Occupational Health. Central Labour Institute (CLI), Mumbai, working under the Minis try of

Labour has four regional labour institutes. The Institute carries out training and research related to industrial safety and health. But till date there is no agency, covering safety and health issues for workers in unorganized sectors[7].

If we look for the availability of trained OH physicians, very few Universities in India are providing postgraduate courses in the field of Occupational Health and there separate short trainings for Occupational Health and Safety for health and safety professionals[7,9].

Looking to above scenario there is urgent need to take action to provide good quality of Occupational Health Services to the employees in Organized Sector and atleast a basic level of Occupational Health Services for the employees working in Un-organized Sector. This can be achieved by incorporating the occupational health services with the primary health care delivery system in India. India has very good primary health care system in rural and tribal areas and also trying to get similar system in urban areas. Unorganised sectors and small scale industries can not afford the full flag OHS centre. In this scenario suggested model of incorporation can be as follows :

- Institutions like NIOH and CLI have to work as apex body with more national centres or regional centres with additional responsibility of capacity building and preparation of guidelines for uniformity of services.There are more than 300 medical colleges in the country in rural as well as urban areas.
- Nodal centres can be established in these colleges, to carry out the training and research in Occupational Health as under guidance of the Apex institutes and need of community. The Dept. Of Community Medicine can act as key for above activities with involvement of other departments like General Medicine, Respiratory Medicine, Orthopaedics, Skin & VD, ENT etc for their supportive role in OH.
- Nodal Centres can train all medical officers of Primary Health Centres, Community Health Centres and Civil hospital staff of state over time and also develop the surveillance mechanism of occupational diseases.
- Here one should not forget the big service provider i.e. private practitioners. They should also be involved in training and surveillance activities related to OH in later phase.
- The regular feedback to government, stake holders, industries and community should be the inherent part of the program
- Non-Government Organizations are also working for occupational health of community. They should promote for the awareness and accountability aspect of the issue.
- The most important need of above service is the coordinated action at Ministry of Labour, Ministry of Health and Family Welfare and other respective ministry.
- This is suggested primitive model of incorporation of occupational health services with primary health care by which we can attain the Goal of "Occupational Health Services for ALL". Still it requires more inputs form various agencies for refinement.

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**"The most basic and powerful way to connect to another person is to listen. Just listen. Perhaps the most important thing we ever give each other is our attention…. A loving silence often has far more power to heal and to connect than the most well-intentioned words."**

**Rachel Naomi**

**Original article**

# Evaluation of knowledge about Integrated Management of Neonatal and Childhood Illnesses (IMNCI) approach among the internee doctors

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**Abstract:**
IMNCI is an important strategy being implemented across our country with the aim of reducing infant as well as children under-5 mortality. It has also been incorporated in the undergraduate curriculum for M.B.B.S. This cross-sectional study was carried out among 100 internee doctors of Smt. NHL Municipal Medical College, Ahmedabad. The results showed that 32% internee doctors were not able to classify child's illness for possible infection based on symptoms given. Also only 50% correctly knew the National Immunization Schedule. The only descriptive question related to treatment of malaria as per the IMNCI guidelines was not attempted by 21%.

**Keywords:** IMNCI, examination, classification, treatment, Internee doctors

## Introduction

It is known to us that over the last three decades the annual number of deaths among children less than 5 years of age has decreased by almost a third[1]. However, this reduction has not been evenly distributed throughout the world. Every year more than 10 million children die in developing countries before they reach their fifth birthday. Seven in ten of these deaths are due to acute respiratory infections (mostly pneumonia), diarrhea, measles, malaria or malnutrition – and often to a combination of these illnesses[1]. Although various prevention and treatment strategies to prevent morbidity and mortality among children have already proven effective. Evidence suggested an integrated approach should be made available to manage sick children to achieve better outcome. So, during the mid- 1990s, the WHO, in collaboration with UNICEF and other agencies, institutions and individuals developed a strategy known as Integrated Management of Childhood Illness (IMCI). The IMCI strategy addressed curative care, various aspects of nutrition, immunization and other important elements of disease prevention and health promotion. This strategy has been expanded in India to include all neonates and is renamed as "Integrated Management of Neonatal and Childhood Illness (IMNCI)"[1].

As a part of the strategy to reduce Infant and Under-5 Mortality, IMNCI has been implemented across the country. The IMNCI training is being given to all health personnel as well as to the Anganwadi workers. The training has been included in Undergraduate Curriculum for M.B.B.S. students since 2006-07 to bring awareness as well as to strengthen their knowledge and skills. The medical students are usually given this training in their 6th semester.

The objective of our study was to assess the knowledge of the internee doctors of Smt. NHL Municipal Medical College who had undergone the IMNCI training in 2008 during their undergraduate study, to classify and treat children below five years as per the IMNCI norms.

## Methodology

This cross sectional study was carried out during April-May 2010 where total 124 internee doctors were approached, informed about the study and oral consent was taken from them. These internee doctors were given a pre-designed questionnaire which included multiple choice questions based on the physician chart booklet given to them during their training on IMNCI in their U.G. curriculum. They were also asked to use the chart booklet to answer the questions if they want. The questionnaire included questions about the classification of symptoms, examination of child, treatment for various classifications and advice to mother/ caretaker. Totally 100 interns were assessed.

## Results

Out of 100 interns, only 43 correctly knew the aims & objectives of IMNCI.

The questions related to examination, classification and appropriate treatment of a child for infection showed that 56% knew correct examination methods, 68% could correctly classify, 24% could cite the correct pre-referral treatment, 31% could answer the correct dose and dosages of antibiotic treatment and 27% could answer the correct advice to be given to the mother / care taker. (Table-1).

The questions related to diarrhea showed that 49% knew correct examination points and questions to be asked in children with diarrhea. 82% could correctly classify the illness. It was found that less than 40% of internee doctors could correctly answer various treatments for various types of diarrhea.

Interestingly, 64% could answer about vaccines to be given, 42% knew correct doses and 50% correctly knew the National Immunization Schedule.

**Table-1: Knowledge about Infection, Diarrhea and Immunization**

| QUESTION | CORRECT ANSWER (n = 100) |
|---|---|
| **INFECTION** | |
| Examination | 56 |
| Classification | 68 |
| Pre-referral treatment | 31 |
| Antibiotic treatment | 24 |
| Advice to mother | 27 |
| **DIARRHOEA** | |
| Examination | 49 |
| Classification | 82 |
| Plan – C | 36 |
| Plan – B | 41 |
| Plan – A | 38 |
| Antibiotic treatment | 27 |
| Follow up | 34 |
| **IMMUNIZATION** | |
| Vaccines | 64 |
| Dose | 42 |
| Schedule | 50 |

Out of 100, 62 internees correctly knew the features of malaria and only 10% could identify the treatment as per IMNCI norms. The question related to treatment of malaria was the only descriptive question in the questionnaire and it was not attempted by 21 internees. (Table-2).

**Table-2: Knowledge about Malaria**

| Qestion | Correct | Not correct | Not attempted * |
|---|---|---|---|
| Features | 62 | 38 | -- |
| Treatment | 10 | 69 | 21 |

* The question related to treatment for malaria was a descriptive one and 21 internees did not attempt the question.

About 56% knew correct method of examination for identifying feeding problems, 51% knew correct classifications and only 16% knew appropriate treatment for the same. As far as malnutrition is concerned, 78% knew correct examination for malnutrition, 82% could correctly classify and 61% knew correct treatment for the same. It was found that 33% knew correct examination of anaemia, 66% could correctly classify and 44% knew the correct treatment for anaemia. (Table-3).

**Table-3: Correct Knowledge about Feeding Problems, Malnutrition and Anaemia**

| QUESTION | CORRECT ANSWER (n = 100) | | |
|---|---|---|---|
| | Feeding problems | Malnutrition | Anaemia |
| Examination | 56 | 78 | 33 |
| Classification | 51 | 82 | 66 |
| Treatment | 16 | 61 | 44 |

## Discussion

Although it is found that at the end of the training when feedback is taken from students, majority of them feel that the IMNCI training is excellent in terms of improving their skill and knowledge regarding pediatric practice, the study showed that only 43% of the participants correctly knew the aims of IMNCI. It also showed that many of the participants could not correctly examine, classify and treat the children as per the IMNCI norms. It was also found that the knowledge and the approach to a child as per the IMNCI strategy was not up to the mark.

## Recommendations

Although the IMNCI training is given by both the Community Medicine and the Pediatrics Departments, the students should be encouraged to implement the IMNCI approach whenever they are posted in the Pediatrics ward in their concerned semesters.

Also, during the internship posting in Pediatric ward, hands-on-training for IMNCI should be emphasized.

## Limitations

The sample size is less and hence the interpretations can not be generalized to all internee doctors. But, this is an important aspect dealing with the reduction of morbidity and mortality in children. Further studies could be carried out and necessary moderations can be done.

**Acknowledgement**

We are thankful to Devashri, Keshavi, Kush, Raghvesh and Kush, students of our college for assistance in data collection.

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**Original Article**

# Prevention of Hepatitis B; knowledge and practices among Medical students

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**Abstract**

**Background**: Hepatitis B is the major infectious disease of mankind. It is the most common cause of chronic hepatitis, liver cirrhosis and hepato-cellular carcinoma World wide. The health professionals are at the maximum risk. Vaccination against Hepatitis B can prevent this deadly disease. This survey was conducted to assess the knowledge and status of Hepatitis B vaccination among the medical students of B.J.Medical College, Ahmedabad, Gujarat, India.

**Methods:** A cross-sectional study was conducted among 150 medical students of II, III/I and III/II year Professional course. Pretested questionnaire were administered to 50 students of each semester. Data was analyzed using SPSS version 16.0.

**Results:** 86.7 % of the medical students had correct knowledge about Hepatitis B virus, though only 66 % of II year students knew about the virus. Majority of the medical students had correct knowledge regarding mode of transmission. However, the knowledge was found to be less among II year students. Only 20% of the II year students had the correct knowledge regarding Post Exposure Prophylaxis for hepatitis B. 29.3% of the medical students were not vaccinated for Hepatitis B.

**Conclusion:** The present study indicates that there is lack of awareness about Hepatitis B, its route of transmission and modes of prevention among the medical students entering into the profession. Similarly, all the students were not vaccinated against Hepatitis B, which makes them vulnerable to the disease.

**Key Words**: Awareness, Hepatitis B, Prevention, Vaccination

## Introduction

Hepatitis is an inflammatory disease of the liver which may be caused by the Hepatitis B virus(HBV). Hepatitis B is a global problem, with 66% of all the world population living in areas where there are high levels of infection[1]. There are more than 2 billion people World-wide, having evidence of recent or past HBV infection and 350 million are chronic carriers. In South East Asian Region, there are estimated 80 million HBV carriers (about 6% of the total population).[2] India has the intermediate endemicity of hepatitis B, with hepatitis B surface antigen prevalence between 2% and 10% among the population studied. The number of carriers in India has been estimated to be over 40 million. [3]

The practice of modern medicine has "contributed" a lot in the increase of the cases and spreading the disease in the society. Hepatitis B infections are common due to lapse in the sterilization technique of instruments or due to the improper hospital waste management as 10 to 20% health care waste is regarded hazardous and it may create variety of health risk.[4] Among the health care personnels', HBV is transmitted by skin prick with infected, contaminated needles and syringes or through accidental inoculation of minute quantities of blood during surgical and dental procedures. Knowledge regarding the Hepatitis B virus and safety precautions is needed to minimize the health care settings acquired infections among health personnel. They should have complete knowledge of Hepatitis B infections, importance of vaccinations and practice of simple hygienic measures apart from that of specific protective measures.

Medical students being part of the health care delivery system are exposed to the same, if not greater, magnitude of risk as other health care workers when they come in contact with patients and contaminated instruments. They are the first level of contact between patients and medical care. They are expected to undertake activities related to patient care with the beginning of their clinical years. After the epidemic outbreak of Hepatitis B in Modasa town of Sabarkantha District of Gujarat, it was decided to find out the level of awareness among medical students who are at the highest risk of developing hepatitis B during their clinical postings. As on date, very few studies

have been conducted to find out the knowledge of medical students regarding Hepatitis B. Therefore this study was conducted to assess the knowledge, attitude and practices regarding Hepatitis B, amongst medical students.

**Methods and material :**

The medical curriculum in universities across Gujarat spans over a period of 5½ years. From 2nd year onwards, students begin their clinical rotation at majority of the institutions. Therefore a cross-sectional study was conducted amongst the 2nd, 3rd part I and 3rd part II students of B.J.Medical College, Ahmedabad, Gujarat, India. Students of preclinical years (1st year) were excluded from the study. A total of 150 students were recruited using a non probability random sampling technique, through lottery method in which all the units of the population were numbered from 1 to N for all three batches (sampling frame). These numbers were written on small slips of paper, of the same size. The slips were thoroughly mixed and one slip was picked up to select one unit. Again the populations of slips were mixed and the next unit was selected. In this manner, the numbers of slips equal to the sample size 150 were selected. The units of the population which appeared on the selected slips made the simple random sample. This method of selection is commonly used when size of the population is small. A pretested structured questionnaire was administered during a two weeks period in February 2010, to collect information about the knowledge, attitude and practices of students regarding hepatitis B. Data was entered and analyzed in SPSS version -16 and was presented in form of simple tables and graphs.

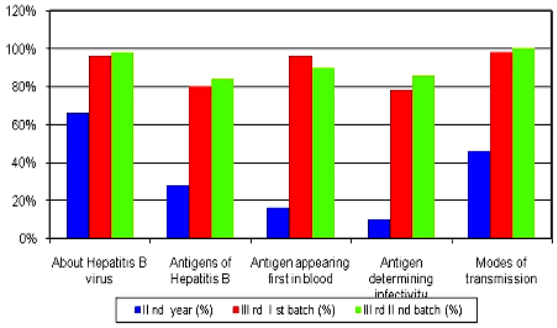
**Results :**

A total of 150 students belonging to II year, III/I and III/II were approached for the study. 50 students each were taken from each semester. The mean age of respondents was 21.02 ±1.59 years.

***Knowledge regarding Epidemiology of Hepatitis B Virus***

86.7 % of the medical students had correct knowledge about Hepatitis B virus though only 66 % of II year students knew about the virus as compared to III year (96%) students. The difference between the knowledge of II and III year medical students was found to be statistically significant at 95% confidence interval (Z=4.28). 64 % of medical students had the knowledge regarding antigens of hepatitis B virus however very few students of II year had the knowledge as compared to III year students. Regarding Antigens appearing first in blood and antigens determining infectivity, the overall knowledge was fair but it was very low among II year students. The knowledge about mode of transmission was less in II year students as compared to III year students.(Figure 1)

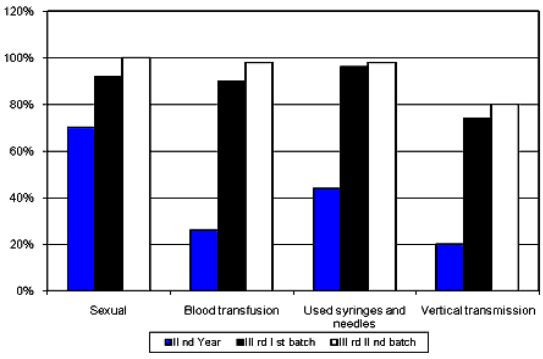
**Figure 1: Knowledge regarding Epidemiology of Hepatitis B Virus:**




***Knowledge regarding transmission of Hepatitis B***

Majority of the medical students had correct knowledge regarding mode of transmission however the knowledge was found to be less among II year students as compared to III years students .The knowledge about transmission of Hepatitis B through sexual route (74%) by used needles and syringes (83%) by blood transfusion (87%)and through vertical transmission (78% ) was fairly high among overall medical students however only (20-40% ) of the II year medical students had correct knowledge regarding the same.(Figure 2)

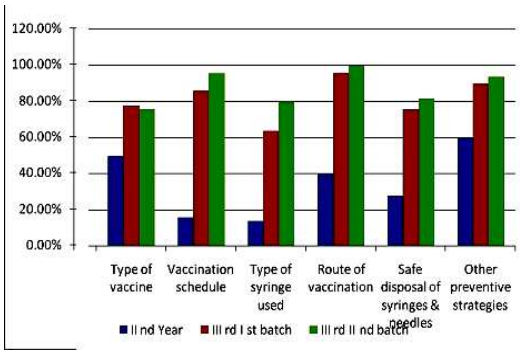
**Figure 2: Knowledge regarding transmission of Hepatitis B**




***Knowledge regarding prevention of Hepatitis B***

The study reveals that majority of the III year students knew about the vaccine type , vaccination schedule ,type of syringes ,route of administration ,safe disposal of syringe and needles and other preventive strategies .Very few second year students had correct knowledge regarding the same.(Figure 3)

Figure 3: Knowledge regarding prevention of Hepatitis B




***Knowledge regarding Post Exposure Prophylaxis for Hepatitis B***

The students were asked about risk and post exposure prophylaxis of Hepatitis B. Majority of the students of III year gave correct answers of the questions while only 20% of the II year students had the correct knowledge regarding PEP for hepatitis B.

***Vaccination Status among medical students***

84 % of the II year medical students were completely vaccinated for hepatitis B as compared to final year students where complete vaccination was observed among only 50-60 % of the students. The vaccination was found to be less among girls as compared to boys. Though it was statistically insignificant among III year students but significant difference was observed among II year students at 95% confidence interval. ( $X^2$=4.50, p<0.05)(Table 1)

***Reasons for not taking vaccine of Hepatitis B***

29.3% of the medical students were not vaccinated for Hepatitis B. Reasons were, "vaccination is not necessary" (36%), lack of information (28.50%) and "afraid of needles" (14.3%).

**Table 1: Vaccination Status among medical students**

| Vaccination status | II year | | | III / I batch | | | III/ II batch | | |
|---|---|---|---|---|---|---|---|---|---|
| | B (N=25) | G (N=25) | Tot (N=50) | B (N=25) | G (N=25) | Tot (N=50) | B (N=25) | G (N=25) | Tot (N=50) |
| Hepatitis B vaccine taken | 21 | 13 | 34 | 16 | 15 | 31 | 16 | 13 | 29 |
| Hepatitis B vaccine not taken | 4 | 12 | 16 | 7 | 5 | 12 | 5 | 11 | 16 |
| Percentage of vaccinated students | 84% | 52% | 68% | 64% | 60% | 62% | 64% | 44% | 58% |
| Chi-square with Yates correction | $X^2$=4.50,p<0.05 | | | $X^2$=0.00, p>0.05 | | | $X^2$=1.98, p>0.05 | | |

**Discussion**

HBV infection is caused by DNA virus with incubation period of 21-135 days.[5] Hepatitis B virus (HBV) infection is an occupational risk for physicians and surgeons especially in developing countries where a carrier rate is about 4%. HBV infection kills about 1.1 million people globally every year[6]. However, incidence of HBV infection could be brought down by giving proper education regarding its transmission and immunization of all medical students with Hepatitis B vaccine.

The level of knowledge regarding epidemiology was fairly good among III year medical students as compared to II year students. There is no formal school based health education in our country which may be the important reason of lower knowledge of Hepatitis B among II year students. Similar level of knowledge was found in the medical students of Delhi [7]. However the medical final year students are more knowledgeable as compared to students of Bangladesh and that of Vietnam .[8]

Scientific knowledge regarding HBV transmission is essential for medical students. They can take proper protection during their clinical posting as HBV is 50 times easier to transmit than HIV[9]. The study revealed majority of the final year medical students and very few students of II year had correct knowledge regarding transmission of the disease in contrast to first year students in Karachi who had better knowledge regarding the transmission.[10]

It is common information and many students have concluded that compared to other health care workers, medical students were more at the risk of exposure to risk factors of hepatitis B and especially per-cutaneous injuries [11,12,13,14,15,16,17].

Final year students had better knowledge regarding prevention of HBV as compared to first year students. There is need for more focused efforts and preventive measures to be put in to protect the medical students from the deadly infection. Regarding PEP only 20% of the second year students were aware which calls for well structured health education programs stressing on the misconceptions prevalent among the students.

In the present study, 63% of the students were vaccinated against Hepatitis B. Although the percentage of vaccinated students was high among second year students but it is not statistically significant ($X^2$=4.35, df=2,p>0.05). This was higher than the vaccination status of 42% reported among medical students of Lahore and the vaccination status in a similar study conducted in Bombay.[18] However in the present study, vaccination status of medical students was lower than the vaccination rate of 80% in

medical student, high lighted by a similar study conducted in Orissa, India. [19]

The present study concludes that there is lack of awareness among the medical students entering into the profession about the hazards of Hepatitis B, its transmission and mode of transmission. More over, all the students were not vaccinated against Hepatitis B, which made them more vulnerable to the disease. Since medical students are at increased risk of acquiring needle stick injury, and increased prevalence rate of Hepatitis B in India, medical students should be routinely vaccinated upon entry into the medical college. It is recommended that a policy be implemented for complete vaccination and health education of all medical students in first year in all medical colleges in our region. However, antibody titers should be routinely checked among all vaccinated because of non-response to the first series of vaccination.

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**"The doctor of the future will give no medicine, but will interest his patients in the care of the human frame, in diet, and in the cause and prevention of disease."**

***-Thomas Edison, Inventor***

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## Original Article

# A study on road traffic accidents in Anand-Gujarat

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**Abstract**

**Background:** Road traffic injuries are a major; but neglected global public health problem, requiring concerted efforts for effective and sustainable prevention.

**Objectives:** The following study analyses the (i) age and sex distribution of injured in road traffic accidents (RTA), (ii) distribution of injured in road traffic accidents by mode of transport and victim role, (iii) the distribution of injured in road traffic accidents by counterpart to which they hit (iv) transportation time required to shift the patients, and (v) the fatality rate in road traffic accidents.

**Materials and methodology**: The present study is a retrospective record based study and data was collected using questionnaire method (for collecting relevant information)

A total of 423 RTA cases were studied from the case records of the medical records section of Shree Krishna Hospital, Pramukhswami Medical College in the said period: 1st October 2007 to 31st March 2008. All the road traffic accident cases coming in the particular specified time period were taken. Results are interpreted in terms of %, mean, S.D, median, $\chi^2$ test

**Results**: The results revealed that (i) out of total 423 RTA cases, 327(77.3%) of the victims were males and the rest 96 (22.7%) were females. (ii) The highest number of victims 122 (28.8%) were from 21-30 years of age group. In males the maximum numbers of cases were seen in the age group 21-30 years (31.8%); whereas in case of females the highest numbers of cases were seen in the age group 31-40(21.9%). 55.79 % of the RTA victims were drivers and riders followed by the occupants and passengers (30.26%). (iii) 41.9% of two wheeler users were hit by 4 wheelers (iv) 48.1% victims managed to reach hospital in less than an hour, 2.8% cases reached the hospital after 6 hours of delay.

**Keywords:** RTA, Mode of transport, Victim role, Transportation time, Anand

**Introduction:**

An accident is "occurrence in a sequence of events which usually produces unintended injury, death or property damage". Accidents represent a major epidemic of non-communicable disease in the present century. They are part of the price we pay for technological progress. [1]

Worldwide, the number of people killed in road traffic accidents (RTA) each year is estimated at almost 1.2 million, while the number of injured could be as high as 50 million. Nearly 50 lakh people lost their lives due to injury as per WHO estimates during the year 2002. Road traffic injuries are a major; but neglected global public health problem, requiring concerted efforts for effective and sustainable prevention. Of all the system that people have to deal with on a daily basis road transport, is the most complex and the most dangerous.[2]

The road traffic injury problem began before the introduction of the car; however, it was with the car – and subsequently buses, trucks and other vehicles – which escalated the problem rapidly. By various accounts, the first injury crash was supposedly suffered by a cyclist in New York City on 30th May 1896, followed by a few months later by the first fatality, a pedestrian in London.[3]

In a dubious distinction for the country, the World Health Organization has revealed in its first ever Global Status Report on Road Safety that more people die in road accidents in India than anywhere else in the world, including the more populous China. Calling road fatalities an "epidemic" that will become the world's fifth biggest killer by 2030, the report said while rich nations had been able to lower their death rates, these were sharply on the rise in the third world. It said 90% of deaths on the world's roads occur in low and middle-income countries (21.5 and 19.5 per lakh of population, respectively) though they have just 48% of all registered vehicles. The statistics for India are chilling. At least 13 people die every hour in road accidents in the country, the latest report of the National Crime Records Bureau reveals. In 2007, 1.14 lakh people in India lost their lives in road

mishaps — that's significantly higher than the 2006 road death figures in China, 89,455.[4]

**Objectives:**

The present study has been carried out to -

1) study the age and sex distribution of injured persons in RTA
2) find out the distribution of injured persons in road traffic accidents by mode of transport and victim role
3) study the distribution of injured persons in road traffic accident by counterpart to which they hit.
4) find the transportation time required to transfer the patients from the site of accident to hospital
5) find the fatality rate.

**Materials & Methods:**

This study was conducted at Shree Krishna Hospital of PramukhSwami Medical College, Karamsad, Anand, Gujarat. The study includes cases reported and recorded from October 2007 to March 2008. Data was collected from the medical records section of the hospital, based on the prepared questionnaire (for collecting relevant information) after due permission from the responsible authorities. The study encompasses the road traffic accident cases reported during the 6-month period. Prior to study, Ethical committee approval was taken and confidentiality is maintained in obtaining information related to accident events.

**Study Design-** Retrospective record based study

**Sampling Method**: Case papers of Road traffic accidents from the medical records section were read and the necessary details were sought in terms of age, sex, mode of transport, victim role, counterpart, outcome of accidents and transportation time required to shift the victim. The cases with inappropriate details were not taken into consideration The analysis is done by EPI-info package and the results were interpreted in terms of %, mean, S.D, median, $\chi^2$ test

**Sample size –** A total of 423 RTA cases were studied from the case records of the medical records section in the said period: 1st October 2007-31st March 2008.All the road traffic accident cases coming in the particular specified time period were taken. All the 423 cases were studied and analyzed for the different variables.

**Observations:**

Out of total 423 RTA cases, 327 (77.3%) of the victims were males and the rest 96 (22.7%) were females. The highest number of victims 122 (28.8%) were from 21-30 years of age group followed by 87 (20.6%) in the age group 31-40 years. In males the maximum numbers of cases were seen in the age group 21-30 years (31.8%); whereas in case of females the highest numbers of cases were seen in the age group 31-s40(21.9%). The age group of 21-40 is almost covering 50% of the cases. The mean age of the RTA victim came out to be 32.49 yrs. (Table 1)

**TABLE 1 – Age-sex distribution**

| Age | Male (%) | Female (%) | TOTAL (%) |
|---|---|---|---|
| 0-10 | 13(4.0) | 14(14.6) | 27(6.4) |
| 11-20 | 43(13.1) | 8(8.3) | 51(12.1) |
| 21-30 | 104(31.8) | 18(18.8) | 122(28.8) |
| 31-40 | 66(20.2) | 21(21.9) | 87(20.6) |
| 41-50 | 52(15.9) | 16(16.7) | 68(16.1) |
| 51-60 | 34(10.4) | 9(9.4) | 43(10.2) |
| ≥60 | 15(4.6) | 10(10.4) | 25(5.9) |
| TOTAL | 327(100.00) | 96(100.00) | 423(100.00) |

$\chi^2$ 23.369, p-0.0007, df- 6

Mean- 32.49; S.D-15.43; Median-30.00

The result is highly significant.

**TABLE 2 : Distribution by victims' role:**

| Victim role | No.s (%) |
|---|---|
| Drivers/Riders | 236(55.79%) |
| Passengers/Occupants | 128(30.26%) |
| Pedestrians | 59(13.94%) |
| Total | 423(100.00) |

Table 2 revealed that 236 (55.79 %) victims were drivers and riders, followed by the 128 (30.26%) occupants and passengers and 59 (13.94%) pedestrian.

**TABLE 3 : Injured drivers/riders:**

| Drivers/Riders | ICD-10 Codes | No.s (%) |
|---|---|---|
| 2 wheeler | V20-V29 | 177(75.0%) |
| 3 Wheeler | V30-V39 | 04(1.69%) |
| 4 wheeler | V40-V49 | 25(10.59%) |
| Bus | V70-V79 | 00(0.0%) |
| Truck | V50-V59 | 03(1.27%) |
| Tractor | V80-V89 | 01(0.42%) |
| Bicycle | V10-V19 | 25(10.59%) |
| Camel cart | V80-V89 | 01(0.42%) |
| Total | | 236(100%) |

Distribution of injured drivers /riders is shown in Table 3. The results revealed that out of total 236 drivers/riders, 75.0% were 2 wheeler riders followed by 10.59% 4 wheeler riders /drivers and 10.59% bicyclists.

Amongst passengers /occupants 35.15% were 2 wheeler pillion riders followed by 32.81% 3 wheeler passengers, 18.75% bus passengers and 13.28% 4 wheeler occupants /passengers.

**TABLE 4: Injured passengers/occupants:**

| Passengers/Occupants | ICD-10 Codes | No. (%) |
|---|---|---|
| Pillion rider 2 wheeler | V20-V29 | 45(35.15%) |
| 3 Wheeler | V30-V39 | 42(32.81%) |
| 4 wheeler | V40-V49 | 17(13.28%) |
| Bus | V70-V79 | 24(18.75%) |
| Total | | 128(100.0%) |

Table 5 shows the distribution of study subjects by mode of transport stratified by sex. Results shows that users of 2 wheeler were injured maximum222 (52.5%) followed by pedestrians 59 (13.9%), 46 (10.9%) 3 wheeler users,42 (9.9%) 4 wheeler users, 25 (5.9%) bicycle riders, 24 (5.7%) bus passengers,3 (0.7%) truck drivers and 1 (0.2%) each camel cart rider and tractor rider.

In both males and females, the maximum injured were using 2 wheeler (56.6%) and (38.5%) followed by pedestrians (10.4%) and (26.0%) respectively.

**TABLE 5: Mode of transport stratified by sex:**

| Mode of Transport | Sex | | Total (%) |
|---|---|---|---|
| | Male (%) | Female (%) | |
| 2 wheeler | 185(56.6) | 37(38.5) | 222(52.5) |
| 3 wheeler | 33(10.1) | 13(13.5) | 46(10.9) |
| 4 wheeler | 29(8.9) | 13(13.5) | 42(9.9) |
| Bicycle | 23(7.0) | 2(2.1) | 25(5.9) |
| Bus | 18(5.5) | 6(6.3) | 24(5.7) |
| Camel cart | 1(0.3) | 0(0.0) | 1(0.2) |
| Tractor | 1(0.3) | 0(0.0) | 1(0.2) |
| Truck | 3(0.9) | 0(0.0) | 3(0.7) |
| Walking | 34(10.4) | 25(26.0) | 59(13.9) |
| Total | 327(100.0) | 96(100.0) | 423(100.0) |

Out of total 222 two wheeler users, 93 (41.9%) of them were hit by 4 wheeler followed by 2 wheeler 66 (29.7%) and out of 59 pedestrians, 33 (55.9%) were hit by 2 wheelers followed by 4 wheeler 14 (23.7%). (Table 6)

**TABLE 6: Two wheeler users and pedestrians by the counterpart they hit:**

| Counter Part | Mode of Transport | |
|---|---|---|
| | Walking (%) ICD-10 codes-(V00-V09) | 2 wheeler(%) ICD-10 codes-(V20-V29) |
| 2 wheeler | 33(55.9) | 66(29.7) |
| 3 wheeler | 6(10.2) | 21(9.5) |
| 4 wheeler | 14(23.7) | 93(41.9) |
| Animal | 0(0.0) | 5(2.3) |
| Bicycle | 0(0.0) | 8(3.6) |
| Bus | 1(1.7) | 4(1.8) |
| Fixed object | 0(0.0) | 2(0.9) |
| Lorry | 0(0.0) | 2(0.9) |
| Pedestrian | 0(0.0) | 7(3.2) |
| Tractor | 3(5.1) | 4(1.8) |
| Truck | 2(3.4) | 10(4.5) |
| Total | 59(100.00) | 222(100.00) |

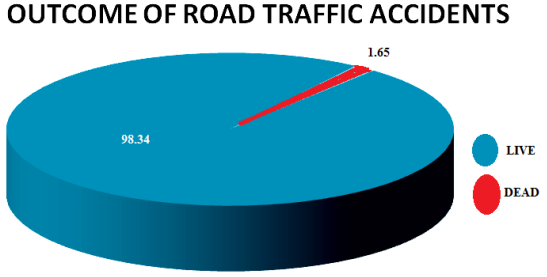
Data in Table 7 shows that out of 423, 203 (48.1%) victims managed to reach hospital in less than an hour which is almost 50 % cases. 116 (27.5%) and 50 (11.82%) reached hospital in 1-2 hr and 2-3 hr respectively. 12 (2.8%) cases reached the hospital after 6 hours of delay. Out of the total 423 victims 416 (98.34%) survived, whereas 7 (1.65%) died because of the road traffic accidents. (Figure 1)

**TABLE 7: Transportation time from site to hospital**

| Transportation Time(Hrs) | Frequency (%) |
|---|---|
| <1/2 | 63(14.90) |
| ½ -1 | 140(33.20) |
| 1—2 | 116(27.50) |
| 2—3 | 50(11.82) |
| 3—4 | 30(7.10) |
| 4—5 | 7(1.70) |
| 5—6 | 5(1.20) |
| >6 | 12(2.80) |
| Total | 423(100.00) |

Mean -116.2908 mins; S.D- 338.9228; Median- 60.00 mins

**Figure 1**



**Discussion:**

The results of the present study revealed that 327 (77.3%) of the victims were males and the rest, 96 (22.7%), were females. The highest number of victims 122 (28.8%) were from 21-30 years of age group. In males, the maximum numbers of cases were seen in the age group 21-30 years (31.8%); whereas in case of females the highest numbers of cases were seen in the age group 31-40 (21.9%).The mean age of the RTA victim came out to be 32.49 .The male is to female ratio is 3.40:1. Moshiro C et. al (2005)[5] in their study found that males had significantly increased risk of transport injuries as compared to females. They reported age to be an important risk factor for certain types of injury. They also found transport related injuries to be much common among adults, 15 years and above. Jha et.al (2004) [6] in their study found 83% victims to be male and 17% female victims. The average age of the victims was 31.5 years. The highest number of victims (31.3%) was between 20-29 years of age. Similar results are also seen in the present study. Ganveer and Tiwari (2005)[7] in their study in Nagpur found that number of male victims (85.8%) was more as compared to female victims (14.2%).The results are similar to our study. They found male to female ratio of 6:1.

The present study revealed that out of total 236 drivers/riders, maximum were 2 wheeler riders (75.0%). Patil et.al (2008)[8] also found that out of total 129 drivers, 79 (61.2%) were motorized two-wheeler drivers. It was also observed that out of total 128 passengers/occupants, maximum injured were 2 wheeler pillion riders 45(35.15%) Similar findings were also reported by Patil et.al (2008)[8.]

Users of 2 wheeler were injured maximum, 222 (52.5%), followed by pedestrians, 59(13.9%). The results are in conformity with the findings of Gururaj et al (2005)[9] and Sahadev et al (1994)[10].

Out of total 222 two wheeler victims, 93(41.9%) were hit by 4 wheelers followed by 2 wheelers 66(29.7%) and out of 59 pedestrians 33(55.9%) were hit by 2 wheelers followed by 4 wheelers 14(23.7%).Jha.et.al (2004)[6] in their study also reported that pedestrians (24.4%) were mostly injured by motorized two wheelers. Four wheelers caused injury to 21.2%. Similar results were also reported by Patil et al (2008)[8.] They also reported that pedestrians were injured mostly by 2 wheelers (31.9%) followed by 4 wheelers (29.8%). 63(14.90%) RTA victims reached hospital in less than half an hour and 140(33.20%) reached in the following half an hour. Observations by Singh and Dhattarwal (2004)[11], regarding the time taken to shift patients to road traffic accidents to hospital revealed that 24% reached within half an hour and 57% reached in next one hour .Fatality rate in the present study came out to be 1.65%, whereas fatality rate was 0.8% in the study by Patil et al (2008)[8] .

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**Original article**

# A study of maternal and child health issues among migratory construction workers

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**Abstract**

**Background** - According to recent census 2011, the total population of India is 1.21 billion. In 2001, 309 million persons were migrants based on place of last residence, which constitute about 30% of the population. The female and children are considered associated migrant in India. They are more vulnerable to health and social issues. The present study was conducted to assess the various aspects of Maternl and child healrh (MCH) issues among migratory families.

**Study method** - It was a cross sectional study and conducted in the Sumandeep Vidypeeth Campus, Piparia, district Vadodara . There were 52 families working in campus and all were interviewed for study.

**Results**- Almost 73% of women were illiterate with mean age of menarche 13 years and mean age for marriage 17 years and mean age for first birth 19years. All were from tribal community. Only one child was fully immunized out of 11 children between 12-23 months. Two maternal deaths and death of two children of less than five years were reported among 52 families in last two years.

**Conclusion** - The study reflects that the group is more vulnerable and there is need to focus on this group to achieve goals of MCH.

**Key words** – construction site worker, migrant, MCH indicators, maternal deaths, contraceptive usage

## Introduction:

Globalization and industrialization are emerging trends in India. The unavoidable side effect of industrialization is the construction of large industries, road, government offices, corporate offices, township and many more. For all such constructions, there is need of the large number of construction workers on site. In last one decade the large numbers of small and big construction projects are going on all over India. Construction workers are migrating from one place to other for better opportunity. Migration is a rational decision made by an individual to move from a less advantageous situation, to a more advantageous one after weighing risks and benefits.

Rapid urbanization and industrialization of the areas have generated more employment opportunities and also created better infrastructure. People migrate to such regions perceiving them as greener pastures. According to census 2001, the total population of India is 1028 million. In 2001, 309 million persons were migrants based on place of last residence, which constitute about 30% of the total population of the country[1]. The provisional data of 2011 census reported that the country population reached to 1210 million[2] and thus it is assumed that the migratory population will be more than 2001 census.

Construction workers are one of such migratory group. They may not be pure migratory workers but they have maximum mobility because of the nature of their work. They have to move from one construction site to other as per the directions of the contractors. The important aspect of such workers is that they form the second largest unorganized sector in India after agriculture workers[3]. Several factors make them vulnerable like employment which is permanently temporary, the employer-employee relationship is very fragile and most of the time short lived and the work has inherent risk of life and limb due to lack of safety, health and welfare facilities[4].

In the construction field migratory pattern within India, women and children have always featured as "associated" migrants with the main decision to migrate being taken by the male of the household. As an associated migrant, women are more vulnerable due to reduced economic choices and lack of social support in the new area of destination[5].

Migrants have always been conceptualized as *problematic and Vulnerable in* the context of policies including public health issues. They are disadvantaged compared to the native population and they often have low socio-economic status with no access to either

healthcare or social services. They suffer from mental and emotional vulnerability and low self-esteem, lack of provision of social goods, education and health. The integration of migrants into the local population is often impeded. There is no scope for special care for such vulnerable population in India, at present. Women and children being "Associated Migrants" suffer more.

The current study was conducted with following objectives

**Objectives :**

To find out the demographic and health profile of female Migrant workers.

To know the immunization status, morbidity and mortality pattern of their children less than 5 years of age.

To find out the reproductive health practices of the women of 15 to 45 years of age.

To compare major indicators with National and State general population

**Methods**

The study was a cross sectional study. It was conducted in Sumandeep Vidypeeth Campus, Piparia, district Vadodara, Gujarat, India which is situated in central Gujarat and 15 KM from the city Vadodara. The study participants were selected from construction sites of campus. All families who were working in campus were selected as study participants. The criteria for study population were the female in reproductive age group and living with her husband. Thus, total 52 families living in the campus for construction work formed the study population.

It was decided to take interview of all women at work site who are with children. The study was conducted between months of Feb 2010 to April 2010. After getting ethical clearance for project, all women were interviewed, with informed consent. The pre-tested questionnaire was used by investigator for interview. There were multiple visits made for contacting all women in campus. The basic information like age, religion, education, income etc were collected. The specific information like age at marriage, age at menarche, age at first child, menstrual history, RTI/STI, birth control measure, treatment taken, number of children, vaccination status of children etc were collected.

Thus collected information was compiled in Microsoft excel and analyzed with the help of Epi Info software.

**Results**

All 52 female were Hindu and migrant labour. They came from District Panchmahal which is about 50 Kilometer form Vadodara district, for labour work in campus. The mean age of study population women was 26 years (range: 17-37). All were married and came with family. Almost 73% women were illiterate and 27% were literate maximum up to primary education.

The mean age at marriage was 17 years (range 14 - 21 years) in the study population. Almost 63% got married before legal age of marriage which India is 18 years for female.

First child was born at the mean age of 19 years (16 to 22 years) but almost 20% of females had first child at age less than 18 years.

Almost 50% (n=26) females had children less than three years of age. Of these, 58% females had institutional delivery of last child and remaining had home delivery.

**Table -1 Key Indicators of Reproductive and Child Health compared with NFHS**:

| Key indicators | Present study | NHFS – III India[8] | NHFS –III Gujarat[8] |
|---|---|---|---|
| **Female illiteracy** | 73% | 41% | 32% |
| **Mean age at menarche** | 13 (9-14 yrs) | N/A | N/A |
| **Mean age of marriage** | 17 (14-21 yrs) | N/A | N/A |
| **% Women married by 18** | 36.5% | 44.5% | 33.5 |
| **Mean age at first birth** | 19 (16-22 yrs) | 19.8 | 20.6 |
| **Current use of any method of family planning (%)** | 46% | 56% | 66% |
| **Institutional birth*** | 58% | 48.3% | 54.6% |
| **Children 12-23 months fully immunized (BCG, measles, and 3 doses each of polio/DPT) (%)** | 9% | 43.5 | 45.2 |
| **Children 12-23 months who have received BCG (%)** | 72% | 78% | 86% |

* Based on the last 2 births in the 3 years before the survey

11 children were between 12 to 23 months age. Only two had Mamta card (vaccination card) with records and only one child (9%) was fully vaccinated with BCG, 3 DPT and Polio and one measles and Vit-A supplementation. Nearly

(8/11) 78% children had BCG vaccination scar. All other vaccinations were incomplete. Only one child had received vitamin A dose in last six months.

Almost 27% (14/52) women were using birth control measures at the time of interview; 11 women had undergone tubal ligation and three were using copper-T for spacing. The mean age of women who did tubal ligation was 30 years (22 to 37 years). Almost 58% (30/52) of study population was aware about birth control measures.

About 77% females had regular menstruation cycle. Almost 35% (18/52) had no complaints related to reproductive tract infection or STD. Nearly 30% (16) women had complaints of backache, 8% (4) had lower abdominal pain, 13% (7) had lower abdominal pain and backache, 11% (6) had complaints of vaginal discharge and 10% (5) had vaginal discharge with other symptoms.

Nearly 17% (9/52) females had some morbidity in the previous one month and asked for treatment. Out of morbid women, 6 women took treatment directly from chemist and had not visited a doctor. Remaining women had tried home remedies.

Of 52 families, two had history of death of children (less than five years) and two families had history of maternal death (death of woman during & after delivery) in last two years.

**Discussion**

This was a small observational study. The study was initiated to know the status of maternal and child health of construction site families. The results are really eye opening and gives serious indications to think about health & social issues of construction site workers particularly associated migratory workers. Indian labour statistics reported that 30% of Indian population is migratory as per last census[1]. Almost 63% of females in this study married before the legal age of marriage. This proportion is very high compared to National figure. UNFPA has reported in its fact sheet that 50% of Indian women get married before legal age in 2002[6]. The mean age of first child was 19 years. This showed that the teen age pregnancy was very common in this group. The risk of early primipara makes them vulnerable for maternal mortality. Early marriage and early pregnancy adds to the vulnerability, mortality and morbidity along with high number of pregnancies. There were two child deaths and two maternal deaths in the previous 2 years. As the study sample was very small, the MMR and Child death rate were not calculated but they are likely to be very high..

Table- 1 compares key reproductive and child indicators of study with National Family Health Survey III, Indian scenario and Gujarat Scenario. The table reflects the serious situation of health status of construction site female workers and their children in Gujarat state. The majority of indicators were poor for this group of workers (mother and children). The illiteracy, mean age of marriage, current use of contraception and children vaccination were poor in this group of society. The deaths in children and female are also reported high in this group. Thus, this strata of society is vulnerable. A study from Punjab[7] by Amrit Abro et al also reported similar findings.

There is urgent and definite need to do large scale studies for verification of various RCH indicators in this critical group.

Government of India is spending lots of money for improving maternal and child health under RCH programme and National Rural Health Mission and thus wants to achieve Millennium Development Goal (MDG). But the results are not very encouraging. One of the reasons may be the plight of migrant population, particularly construction site workers. The programme needs to focus on such vulnerable population.

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**Original article**

# Modeling for appropriate awareness of H1N1 influenza among urban population of Vadodara, India

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**Abstract**

**Background:** H1N1 influenza is a viral disease. World Health Organization declared it phase 6 level of pandemic. India, especially Gujarat suffered most from its high case fatality rate. Hence, it was decided to assess awareness level through modelling about H1N1 influenza in urban population of 18 years and above of Vadodara, India.

**Methods**: A pre-designed self-rated instrument survey was conducted among 100 adults of 18 years and above through a cross-sectional study design. Multivariate analysis was performed.

**Results**: The study participants are adequately aware about H1N1 influenza. The final multivariate model reveals that compared to level of high to low level of education, study participants were more likely to be aware of prevention of H1N1 influenza through vaccine (Adjusted OR = 2.79, 95%CI = 1.13-7.65), through hand washing (Adjusted OR = 2.01, 95%CI = 0.93-4.58), more than 18 years as age of contracting H1N1 influenza (Adjusted OR = 6.17, 95%CI = 1.98-8.90) and isolation of infected person (Adjusted OR = 2.18, 95%CI = 1.22-4.81).

**Conclusion:** There is an appropriate awareness level regarding various aspects of H1N1 influenza among urban adult population. We believe that our model also helps us for dealing future pandemic not only in urban area but also in rural area.

**Key Words**: H1N1 influenza, Pandemic, Awareness, Modeling, India

## Introduction:

H1N1 influenza (Swine flu, Hog flu, or Pig flu) is an infection by any one of several types of Swine influenza virus (SIV). SIV is any strain of the influenza family of viruses that is endemic in pigs[1.] World Health Organization (WHO) declared H1N1 influenza as a phase 6 level pandemic on June 2009[2].

India ranked 3rd most affected country for cases and deaths of H1N1 influenza globally[3] and it is probably one of the most dreadful words in the lexicon of Gujarat, especially in Vadodara where people equate it to death because of its upward curve towards case fatality rate.

The panic affected behavior not only from closing the schools but also people become xenophobic and this stands for the importance of cultural transmission in our society, where such transmission affects the spread of the disease itself [4]. The distribution of proper information to the public on the status of the H1N1 influenza pandemic will be very crucial for achieving the awareness of the potential risks and the optimum code of behavior during the pandemic. Few modeling based studies revealed that behavioral interventions can be effective in mitigating the epidemic of H1N1 influenza[5-6]. Predictors for awareness of H1N1 influenza seem to operate at the individual-level and need to be taken into account while planning rational preventive measures. Hence modeling the predictors for awareness about H1N1 influenza would be the appropriate strategy for creating awareness and preventing the deadly infection. Hitherto, to our knowledge, none has quantified and evaluated the predictors associated with awareness level for H1N1 influenza among urban population. Therefore, the primary goal of this study was to identify the factors through model that might be associated with awareness level. In this context, we have made an effort to predict factors responsible for creating awareness for urban adult population of Vadodara.

## Materials & methods:

The study procedures, including a description of study design, setting, and study population, have been described elsewhere,[7] and are briefly outlined here. A cross-sectional study was conducted during January 2010. The study subject was defined as any person having age 18 years and above of either sex, residing in urban area of Vadodara for at least 2 years and belonging to lower middle and lower class according to Kuppuswamy's socio-economic classification modified in 2007. A pre-designed,

self-rated instrument was used to collect the data after taking verbal consent of the study subjects during house to house survey through convenience sampling methodology. In addition to one of the authors (HNG), one (intern doctor) was assigned the job of data collection. Both were quiet fluent in local (Gujarati) language. The data collector's team was clearly briefed on the process of data collection. Data were analyzed through Statistical Package for Social Science (SPSS) software program for Windows (version 11.5). We had previously computed and published descriptive statistics on the awareness level variables[7]. In this study, we are reporting the univariable associations and multivariate modelling through logistic regression analysis. Univariate logistic regression analysis was conducted by comparing two variables for each variable of interest using odds ratio (OR) and their 95% confidence intervals (CI). Likelihood ratio test was used to estimate odds ratio and 95% CI for odds ratio for all associations of interest. Because of the hierarchical structure of the data, study participants nested within households and the possibility of intra-household correlation regarding the likelihood of awareness and literacy status, we used in multilevel logistic regression analysis [8].

Multivariate logistic regression analysis was performed to adjust for simultaneous effects of multiple factors or to control the effects of confounding factors on the outcome variable. The criteria for inclusion of factors in the multivariate analysis were to include all variables from the univariate analysis with a p-value of ≤ 0.1 along with all the variables of known biological importance[9]. To assess the importance of each variable included in the model, Wald statistic for each variable was used.

**Results:**

The participation rate was 100% (100) when the study participants were explained the benefit of the study. Of 100 participants, 94 heard about H1N1 influenza. Hence, 94 participants were retained for further analysis.

The mean age (years) of participants was 35.64 ± 13.68. Educational status of the majority of the participants were graduate and above and approximately 60% of the participants were employed (Table-1).

**TABLE-1- Socio-demographic characteristics of the study participants**

| Characteristics | Number (n = 94) | Percentages* |
|---|---|---|
| **Sex** | | |
| **Male** | **53** | **65** |
| **Female** | **41** | **44** |
| **Age (years)** | | |
| **18 – 30** | **11** | **12** |
| **31 – 40** | **22** | **23** |
| **41 – 50** | **29** | **31** |
| **> 50** | **32** | **34** |
| **Education** | | |
| **Up to Primary** | **03** | **03** |
| **2ndary and higher Secondary** | **18** | **19** |
| **Graduate** | **51** | **54** |
| **Post-graduate** | **22** | **24** |
| **Occupation** | | |
| **Govt. Service** | **18** | **19** |
| **Private Service** | **13** | **14** |
| **Self-employed** | **24** | **26** |
| **Unemployed** | **30** | **41** |
| **Socio-economic Class (Kuppuswamy's modified for 2007)** | | |
| **Lower Middle (III)** | **31** | **33** |
| **Upper Lower (IV)** | **39** | **41** |
| **Lower (V)** | **24** | **26** |

*All percentages rounded to whole numbers

Although majority of the participants (96%) were of the opinion that H1N1 influenza is an infectious disease and 83% participants correctly ticked the response that it can be prevented but almost 50% participants were not aware of origin of H1N1 influenza.

Coupled with this, relatively good percentage of participants (61%) was quick to respond that vaccination can prevent H1N1 influenza pandemic.

Approximately 87% participants were aware of the causative organism for H1N1 influenza (Table - 2).

**TABLE-2 Awareness about H1N1 influenza among study participants**

| Characteristics | Number (n = 94) | %* |
|---|---|---|
| **Infectious Disease** | | |
| **Yes** | **90** | **96** |
| **No** | **04** | **04** |
| **Causative Organism** | | |
| | **82** | **87** |
| **Virus** | **01** | **01** |
| **Bacteria** | **04** | **04** |
| **Fungi** | **07** | **08** |
| **Parasite** | | |
| **Reservoirs of H1N1 flu** | | |
| **Swine** | **28** | **30** |
| **Human** | **30** | **32** |
| **Swine and Human (Both)** | **30** | **32** |
| **Others (Birds, Animals)** | **06** | **06** |
| **Preventable by Vaccine** | | |
| **Yes** | **57** | **61** |
| **No** | **37** | **39** |
| **Vaccine availability in India** | | |
| **Yes** | **26** | **28** |
| **No** | **68** | **72** |
| **Preventable by Hand washing** | | |
| **Yes** | **77** | **82** |
| **No** | **17** | **18** |
| **Preventable by mask/ handkerchief** | | |
| **Yes** | **87** | **93** |
| **No** | **07** | **07** |
| **Availability of Medicine** | | |
| **Yes** | **56** | **60** |
| **No** | **38** | **40** |
| **Freely Roaming of Infected Person Yes** | **12** | **13** |
| | **82** | **87** |
| **No** | | |
| **Visiting Crowded Places** | | |
| **Yes** | **06** | **06** |
| **No** | **88** | **94** |
| **Age of contracting H1N1 influenza Up to 5 yrs** | **19** | **20** |
| **6 – 18** | **15** | **16** |
| **19 – 60** | **14** | **15** |
| **> 60** | **46** | **49** |
| **Isolation of infected person Yes** | **74** | **79** |
| **No** | **20** | **21** |

*All percentages rounded to whole numbers

**TABLE-3 Univariate analysis for Awareness about H1N1 influenza**

| Variable | Education | | *OR (95% CI) |
|---|---|---|---|
| | Graduation and above | Up to Higher Secondary | |
| **Age (yrs)** | | | |
| **Up to 40** | **25** | **08** | **0.85** |
| **> 40** | **48** | **13** | **(0.28 - 2.60)** |
| **H1N1 Influenza Prevented by vaccine** | | | |
| **Yes** | **50** | **07** | **4.35** |
| **No** | **23** | **14** | **(1.40 -13.90)** |
| **H1N1 Influenza Prevented by hand washing** | | | |
| **Yes** | **62** | **15** | **2.25** |
| **No** | **11** | **06** | **(0.62 – 8.08)** |
| **Age of Contracting H1N1 Influenza** | | | |
| **>18 yrs** | **52** | **08** | **4.02** |
| **Up to 18 yrs** | **21** | **13** | **(1.31 -12.61)** |
| **Isolation of infected person** | | | |
| **Yes** | **59** | **15** | **1.69** |
| **No** | **14** | **06** | **(0.48 – 5.79)** |
| **Roaming of infected person** | | | |
| **Yes** | **06** | **06** | **0.22** |
| **No** | **67** | **15** | **(0.05 -0.93)** |
| **Visiting crowded places** | | | |
| **Yes** | **02** | **04** | **0.12** |
| **No** | **71** | **17** | **(0.01 -0.86)** |

*OR = Odds Ratio
^95%CI = 95% Confidence Interval

Airborne route was most common mode of spread of H1N1 influenza and fever (46%), common cold and cough (39%) were the most common symptoms of H1N1 influenza reported by the participants. As for the common age for contracting H1N1 influenza, 20% participants put forth up to 5 years and for half of the participants above 60 years was the answer.

On univariate analysis, literacy status of the participants is significant with prevention of H1N1 influenza by vaccine (OR = 4.35; 95% CI: 1.40 – 13.94), awareness about age of contracting H1N1 influenza (OR = 4.02; 95% CI: 1.31 – 12.61) and marginally significant for

knowledge on isolation of the infected person (OR = 1.69; 95% CI: 0.48 – 5.79) (Table –3).

The final multivariate model reveals that compared to level of high to low level of education, study participants were more likely to be aware of prevention of H1N1 influenza through vaccine (Adjusted OR = 2.79, 95%CI = 1.13-7.65), through hand washing (Adjusted OR = 2.01, 95%CI = 0.93-4.58), more than 18 years as age of contracting H1N1 influenza (Adjusted OR = 6.17, 95%CI = 1.98-8.90) and isolation of infected person (Adjusted OR = 2.18, 95%CI = 1.22-4.81) (Table – 4).

**TABLE-4 Multivariate model for Awareness about H1N1 influenza**

| Variable | *aOR | ^95%CI |
|---|---|---|
| **H1N1 Influenza Prevented by vaccine** | | |
| **Yes** | **2.79** | **1.13 - 7.65** |
| **No** | **1** | **-** |
| **H1N1 Influenza Prevented by hand washing** | **2.01** | **0.71 - 4.58** |
| **Yes** | **1** | **-** |
| **No** | | |
| **Age of Contracting H1N1 Influenza** | | |
| **>18 yrs** | **6.17** | **1.98 - 8.90** |
| **Up to 18 yrs** | **1** | **-** |
| **Isolation of infected person** | **2.18** | **1.22 - 4.81** |
| **Yes** | **1** | |
| **No** | | |

*aOR = Adjusted Odds Ratio

^95%CI = 95% Confidence Interval

**Discussion:**

The pandemic of H1N1 influenza posed a serious threat to the general population, a cause of great concerns of various health organizations and Governments which has given sleepless nights to health officials. Significant implications for informing the general masses are depending on whether decisions are made collectively (socially) or independently. If decisions are made independently, then knowledge of the predictors through modeling could have a powerful effect on people. To the best of our knowledge, this is the first study of awareness model among urban adults in India so we are unable to compare the results of this study with other Indian studies. However, globally information on behavioral and attitudinal responses to H1N1 influenza pandemic is available[10-14].

If we want to reduce the burden of H1N1 influenza significantly then we have to strengthen the interventions (antiviral drugs, vaccine and behavioral) with utmost force. Although drug Tamiflu is available but effectiveness is demonstrated in early diagnosed cases which is not always the case in resource constraint settings especially in India. Furthermore, scarcity of published literature on effectiveness of vaccine has limited the role of vaccine in prevention of H1N1 influenza. Hence the only practical choice is behavioral intervention, till date.

The present study was an attempt to understand the behavioral intervention by assessing the awareness level of the participants. Our study showed that majority of the participants were adequately aware of the H1N1 influenza regarding causative agent and prevention. The important findings of our study were the knowledge on preventive aspects of H1N1 influenza like vaccine, hand washing, isolation of infected person and age of contracting the infection, through multivariate model.

This cross sectional study also demonstrated that the respondents were appropriately aware about avoiding going out and in crowded places (94%) consistent with findings by Hao H A et al [15]. Our findings for isolation of infected persons (79%) were also consistent with study by Balkhy et al[16].

**Limitations:**

We have selected the study population only from urban area through convenience sampling strategy. Hence there will be limited generalizability.

**Recommendations:**

Based on our findings, we recommend an awareness program on H1N1 influenza for urban as well as for rural area. Further research may be directed for the evaluation of the factors associated with awareness level for urban as well as rural area to improve the knowledge and awareness level on H1N1 influenza.

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**Original article**

# A comparison of the risk factors for the coronary artery diseases among the rural and urban male high school students in Vellore district, Tamilnadu: A school based cross sectional study.

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**Abstract:**

**Background**: Cardiovascular diseases are very important causes of mortality and morbidity in developed as well as developing countries including India. The coronary artery diseases (CAD) tend to occur earlier in life in Indians and more commonly among urban dwellers.

**Objective:** To determine the prevalence of risk factors for CAD among adolescent males and also to look out for the rural-urban differences in the same if any.

**Study design and setting:** A school based cross sectional study in Kaniyambadi block and Vellore town in Tamilnadu, India

**Methodology:**A total of 250 students each from rural areas of Kaniyambadi block and Vellore town were studied using a questionnaire, from May to Aug 2007. All measurements were made using a standardized protocol.

**Results:** The study groups had low CAD risk in terms of BMI, overweight, blood pressure levels, and tobacco and alcohol consumption habits. They had high familial risk factors and conditions in family which make them susceptible to developing CAD, later in life. The urban students were less physically active and led a more competitive life. TV watching was being resorted to as the main relaxation which compromised on the physical activities. The students with parental history of diabetes mellitus had tendency to be overweight and overweight children had elevated blood pressure.

**Conclusions:** The students in both the rural and urban area had various CAD risk factors with the rural students having more physically active lifestyle.

**Key words:** Male adolescents, Cardiovascular disease risk factors, Overweight, Stress, Television watching.

## Introduction:

Cardiovascular diseases (CVD) form one of the significant causes of mortality and morbidity in developed as well as developing countries. India has one of largest numbers of patients with CVDs including coronary artery disease (CAD) and is in the midst of a rapidly escalating 'epidemic' of Diabetes Mellitus and Coronary Heart Diseases (CHD). Projections based on the Global Burden of Disease study indicate that the burden of athero-thrombotic CVD in India will surpass that in any other region in the world by 2020 [1]. It is now well known that CAD tends to occur earlier in life in Indians than in other ethnic groups. In both rural and urban areas there is a significant increase in the prevalence of CHD, more so among young men [2]. This study aims to find the prevalence of these risk factors in early adolescent boys in both rural and urban set up, that may pave way for planning an early intervention.

## Material and Methods:

This is a cross-sectional study carried out in Kaniyambadi block and Vellore town of Tamilnadu in South India. All the schools providing 8th to 10th grade education in Kaniyambadi block were listed and three large rural schools which were farthest from city were selected. The schools in the urban service area were similarly selected. Sample size was calculated so as to power the study to pick the difference in the prevalence of overweight among rural (12%) and urban (5%) school going children[3]. The sample size so calculated was 242 in each arm. All the students in the schools were invited to participate after obtaining permission from the local authorities and explaining to them about the study. Verbal consent was taken from the students.

The students were interviewed using a pre-tested questionnaire. Weight was recorded to nearest 100 gram, and, height and waist circumference to nearest 0.1 cm as per the standardized protocols. Two readings of blood pressure (BP) were recorded in sitting position over left brachial artery before and after the interview and the average of the two readings was taken. Weighing machine and sphygmomanometer were standardized and same set of instruments were used for the entire study. Overweight was defined as weight above 90th percentile of the

Indian Council for Medical Research charts for rural boys[4]. Elevated BP was defined as BP levels greater than 95th percentile by gender, age, and height based on tables for Indian children[5]. We used the term elevated BP as we could not take 3 consecutive measurements as per the standard definitions. Information regarding family history was confirmed with the local health worker for rural students. As regarding the urban students, an attempt was made to confirm the family history by further probing as local health workers were not available. Information about physical activity was collected for a typical day. Similar information was collected separately for weekends (Saturday and Sunday ) as physical activities on these days was found to be significantly different during piloting the questionnaire. The children with identified risk factors were told about the risk factors of the same and adequate interventions were suggested, wherever possible. The data was entered on a Microsoft Excel spread sheet and analyzed using SPSS for Windows 12.0 software.

**Results:**

The urban group was comparatively younger [mean age (in years) urban 13.9 vs. rural 14.6, p<0.001]. The mean values of systolic blood pressure and body-mass index were greater for the rural students whereas waist circumference and diastolic blood pressure were more among the urban students as depicted in the table 1. However only waist circumference was statistically different between the two groups (p=0.003).The prevalence of overweight [urban 30 (12%) vs rural 22(8.8%), p=0.305] and elevated blood pressure [urban 25(10%) vs rural 23(9.2%),p=0.764] was more among urban students though the difference was not statistically significant.

**Table 1-Distribution of different physical measurements in the study population**

| Risk factor | Rural (N=250) Mean | Urban (N=250) Mean | Mean difference | S.E of mean difference | p value |
|---|---|---|---|---|---|
| Waist circumference (cm) | 61.25 | 63.35 | 2.10 | 0.707 | 0.03 |
| Systolic BP (mmHg) | 98.6 | 100.64 | 2.04 | 1.126 | 0.07 |
| Diastolic BP(mmHg) | 61.27 | 60.99 | 0.28 | 0.897 | 0.758 |
| BMI (kg/m²) | 16.58 | 16.78 | 0.20 | 0.269 | 0.448 |

None of the students reported the use of tobacco or alcohol in any form. All the schools provided 2 play periods of 45 minutes each every week. More rural students played daily during non school hours and were engaged in daily physical activity other than sports compared to their urban counterparts. Television (TV) watching and going to tuitions was more common among urban students as shown in table 2.

**Table 2-Distribution of various activities in the study population:**

| Activity | Rural (N=250) | Urban (N=250) | p value* |
|---|---|---|---|
| Other daily physical activity | 23 (9.2 %) | 7 (2.8 %) | 0.002 |
| Daily TV watching | 177 (71.0 %) | 220 (88.0 %) | <0.001 |
| Tuition going | 89 (35.7 %) | 146 (58.4 %) | <0.001 |
| Playing daily | 148 (59.4 %) | 85 (34.0 %) | <0.001 |
| Fetching water daily | 104 (41.8 %) | 90 (36.0 %) | 0.199 |

*for chi-square test. * p values which are significant after applying Bonferroni correction [14].The corrected p value is 0.005 for the same level of significance as uncorrected p=0.05.

Watching TV daily as well as over weekends was more common among urban students. The proportion of students playing daily was more among rural students. The duration among those who played was also more for the rural students, though the difference was not statistically significant (p=0.207). The association between various risk factors and the place of residence of the students in the study group is shown in table 3.

**Table 3: Association of various risk factors to the place of residence in the study population:**

| Risk factor | Rural | Urban | Odds ratio | P value |
|---|---|---|---|---|
| History of parent using smokeless tobacco | 32 12.8% | 11 (4.4%) | 3.2 (1.57-6.37) | 0.001* |
| History of parent using alcohol | 100 40.1% | 67 (26.8%) | 1.83 (1.26-.67) | 0.002* |
| Parental history of hypertension | 20 8.0% | 50 (20.0%) | 0.35 (0.2-0.61) | <0.001 * |
| Parental history of Diabetes Mellitus | 14 5.6% | 32 (12.8%) | 0.40 (0.21-0.78) | 0.008 |
| History of other physical activity daily | 23 9.2% | 7 (2.8%) | 3.53 (1.49-8.40) | 0.002* |
| Playing daily after school hours | 148 59.4% | 85 (34.0%) | 2.84 (1.97-4.09) | <0.001 * |
| Playing over the weekend (sat and sun) | 161 64.6% | 207 (82.8%) | 2.60 (1.71-3.95) | <0.001 * |
| Going to tuition | 89 35.7% | 146 (58.4%) | 0.39 (0.28-0.56) | <0.001 * |

The history of Diabetes Mellitus in any of the parents was a significant risk factor for the students to be overweight [Odds ratio = 2.30 (1.04-5.13), p = 0.042]. Being overweight was a risk factor for elevated blood pressure in the entire study group [Odds ratio = 3.43 (1.65-7.12), p = 0.002). Playing daily after the school hours protected the students against becoming overweight [Odds ratio = 0.52 (0.28-0.95),p= 0.039 ]. The students who watched TV daily were less likely to play daily [Odds ratio = 0.488 (0.313-0.761),p = 0.002].

A large number of the rural students [68 (27.3%)] were also involved in grazing the cattle daily and the mean duration of grazing cattle was 1.56 hours day. In addition an even greater number [78 (31.3%)] of them went for cattle grazing over weekends and holidays for an average of 3.26 hours per day. Among rural students, 41 (16.5%) were also involved in other household activities like caring for the animals, cooking, getting firewood. Among the rural students 29 (11.2%) had to help in the family occupations like garland making, brick work, stone cutting, working in fields etc. Among the urban students 16 (6.5%) had to help in the family occupations like taking care of the shop, beedi making etc. The students in both the groups were also involved in daily errands like fetching water and groceries.

**Discussion and conclusions:**

This study was designed to determine the prevalence of risk factors for CAD and also to look out for the rural-urban differences, if any. The extra older students in the rural arm were due to more number of failures (25.6%) among the rural students. The prevalence of overweight and elevated blood pressure in our study is similar to those reported in other recent studies for urban area but somewhat higher for the rural area[3, 6-10]. The presence of slightly older students among the rural students could have diluted the differences between various physical characters like BMI and blood pressure which are known to increase with age. The urban students were found to be less physically active and led a more competitive life, thereby increasing their CAD risk. The rural students were also more often involved in family occupations which involved physical work. The increasing competition among students very early in life is probably depriving many of the children of a healthy childhood as indicated by high proportion of students attending tuitions. As seen in the study, TV watching is a risk factor for decreased physical activity. TV watching being resorted to as the main relaxation and in certain cases addictive TV watching is of concern. Playing daily after the school hours seems to protect the children from becoming overweight. The fact that students with parental history of Diabetes Mellitus were already overweight and many had elevated blood pressures reaffirms the childhood onset of CVDs and calls for urgent action.

The presence of parents using any form of tobacco and alcohol increases the risk of the children taking up these habits and hence their risks for CAD in long run. In general, research suggests that parental tobacco and drug use may have a considerable impact on the initiation and persistence of smoking in the adolescent child[11]. Li et al, for example, found that parents' tobacco use was significantly associated with the later use of cigarettes, marijuana, and alcohol by their adolescent children, with the strongest influence found for smoking[12]. Passive smoking itself known to be of considerable risk [13].

**Recommendations:**

Many of the CAD risk factors are modifiable. The students, teacher and parents need to be made aware of this. The traditional concept of school health dealing mainly with communicable diseases need to be reoriented to meet the newer health challenges. The teachers need to be trained to incorporate healthy life style and stress management in their teaching sessions. The high school period probably is the best time to start any intervention to prevent non-communicable diseases as the high school students have some idea about the risk factors and start getting exposed to considerable amount of stress both in the school as well as in the home.

**Acknowledgments:**

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**Conflict of interest:**

The study was carried out as MD (Community Medicine) dissertation. All the expenses of the study were borne by the author.The equipments for data collection and help in statistical analysis were provided by the community medicine

department of Christian Medical College, Vellore. The author was permitted to stay away from their duties so as to allow collection of data. There are no conflicts of interests, whatsoever.

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## A Short History of Medicine

**2000 B.C. - "Here, eat this root."**

**1000 B.C. - "That root is heathen, say this prayer."**

**1850 A.D. - "That prayer is superstition, drink this potion."**

**1940 A.D. - "That potion is snake oil, swallow this pill."**

**1985 A.D. - "That pill is ineffective, take this antibiotic."**

**2000 A.D. - "That antibiotic is artificial. Here, eat this root."**

~Author *Unknown*

**Original article**

# Assessment of biomedical waste management practices in a tertiary care teaching hospital in Ludhiana

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**Abstract**

**Objectives :** A study was undertaken to assess the Biomedical waste(BMW) management practices in a tertiary care, teaching hospital of Ludhiana, Punjab.

**Methods :** A 10% sample was selected randomly from each of the 3 categories of staff comprising 476 doctors, 378 nurses and 142 paramedical staff, on rolls. A semi-structured questionnaire was used to obtain information from respondents.

**Results** *:* The study showed gaps in the knowledge of all three categories of respondents. The knowledge of the existence of the BMW Management Rules 1998 was better in doctors than in the nurses or the paramedical staff, but knowledge of the practical aspects of BMW management was better in nurses and paramedical staff. The BMW management practices in the hospital were satisfactory, except for a deficiency in supply of needle-cutters in 40.9% wards.

**Key Words** : Bio-medical waste management, knowledge, practices

## Introduction

Biomedical waste (BMW) is waste generated during diagnosis, treatment or immunization of human beings or animals, or in research activities pertaining thereto, or in the production and testing of biologicals, and is contaminated with human fluids.[1] Though 75-80% of wastes generated from hospitals are non-infectious, 20-25% is hazardous.[2] It is a potential health hazard to health workers, public, flora and fauna of the area.[3] The Government of India has given specifications for hospital waste management under the Environment (Protection) Act Biomedical Waste (Management and Handling) Rules 1998.[4] The present study was undertaken to assess the knowledge and practices regarding BMW management amongst staff of a large tertiary care teaching hospital in Ludhiana, with about 700 beds which, according to its Chief Maintenance Officer, generates about 70 kg biomedical waste per day.

## Methods

The study comprised two parts:

Assessment of the knowledge regarding BMW management amongst doctors, nurses and paramedical staff of the hospital. For this purpose, a 10% sample of each of the 3 categories of staff on rolls was randomly selected for the study, and information was obtained from the respondents through a pre-tested questionnaire. The sample consisted of 100 respondents: 48 doctors, 38 nurses and 14 paramedical staff.

Observation of the actual practices of BMW management in the facilities of the hospital. The OPDs studied were Medicine, Surgery, Pediatrics, Gynecology, Casualty, laboratories and Blood Bank. 22 wards and 14 Operation Theatres were also observed.

## Result

Table-1 shows the knowledge of the respondents regarding BMW management.

Doctors : The knowledge of the doctors was least for identification of biohazard symbol (79.2%), BMW Management Rules 1998 (85.4%), and methods of segregation (87.5%); better about the fact that BMW should not be stored for more than 48 hours (91.7%), for knowledge regarding methods of waste disposal and knowledge of the color coding system (93.7% each); and best for knowledge about categories of waste (95.8%) and knowledge of the diseases transmitted through improper BMW management (98.0%).

Nurses : The knowledge of the nurses was better for the more practical aspects of BMW management. 97.4% nurses knew the categories of BMW, 92.1% knew the color coding system, 94.7% were aware of the methods of segregation, 92.1% were aware that waste should not be stored for more than 48 hours, and 100% knew the methods of waste disposal. In these aspects the knowledge of the nurses was equal to or even better than the doctors. Their knowledge was less for the more theoretical

aspects. 73.7% were aware of the existence of BMW Management Rules 1998, 86.8% were able to identify bio-hazard symbol, while 92.1% knew the diseases spread by improper waste management.

**Table-1: Knowledge of Respondents**

| | Aware of existence of BMW management rules 1998 | Know categories of waste | Know color coding system | Can identify biohazard symbol | Aware of methods of segregation | Aware that waste should not be stored for > 48 hrs | Know methods of waste disposal | Know diseases spread by improper waste management |
|---|---|---|---|---|---|---|---|---|
| Doctors (n=48) | 41 (85.4 %) | 46 (95.8 %) | 45 (93.7 %) | 38 (79.2 %) | 42 (87.5 %) | 44 (91.7 %) | 45 (93.7 %) | 47 (97.9 %) |
| Nurses (n= 38) | 28 (73.7 %) | 37 (97.4 %) | 35 (92.1 %) | 33 (86.8 %) | 36 (94.7 %) | 35 (92.1 %) | 38 (100 %) | 35 (92.1 %) |
| Para-meds (n =14) | 10 (71.4 %) | 14 (100 %) | 13 (92.9 %) | 13 (92.9 %) | 14 (100 %) | 14 (100 %) | 11 (78.6 %) | 12 (85.7 %) |
| Total (n=100) | 79 (79 %) | 97 (97 %) | 93 (93 %) | 84 (84 %) | 92 (92 %) | 93 (93 %) | 94 (94 %) | 94 (94 %) |

Paramedical Staff : The knowledge of the paramedical staff was also similar to the nurses, in that the knowledge regarding the practical application of BMW management was higher than the more theoretical aspects. 100% paramedical staff knew the categories of BMW, 92.9% knew the color coding system, 92.9% could identify bio-hazard symbol, 100% were aware of the methods of segregation, 100% were aware that waste should not be stored for more than 48 hours; 71.4% were aware of the existence of the BMW Management Rules 1998, 78.6% knew the methods of waste disposal, and 85.7% knew about the diseases spread by improper waste management.

The BMW management practices were satisfactory and in accordance with the prescribed rules and standards in all 7 OPDs surveyed except for one OPD where collection and segregation as prescribed was deficient. BMW management practices observed in 22 wards and 14 operation theatres were in accordance with the prescribed rules and standards in all the 14 operation theatres. In the case of the 22 in-patient wards, needle cutters were observed to be present and in use in only 13 (59.1%) wards, apart from which all the BMW management practices were in accordance with the prescribed rules and standards in all the 22 wards.

**Discussion**

Certain deficiencies in the knowledge of various categories of hospital employees were identified. The doctors were observed to be sounder in theoretical knowledge than in the more practical aspects of BMW management. In the case of nurses and paramedical staff the reverse was true, i.e., though their theoretical knowledge lagged behind that of doctors, their practical knowledge regarding BMW management was better. The doctors' attitude towards BMW management is casual, while nurses and paramedical staff are more meticulous and careful. These findings in our study are in agreement with those of Saini, Nagarajan & Sarma.[5] Healthcare waste management should be supported through appropriate education, training and the commitment of the healthcare staff, management and healthcare managers.[6]

The BMW management practices in the hospital were satisfactory, except for a deficiency in supply of needle-cutters in a few wards. This is a typical example of an obstacle coming in the way of a mandatory practice, due to a problem of logistics. It is incumbent upon those responsible for procurement of supplies to ensure timely replacement of such items. It would be better if the user units could be provided with a few extra needle-cutters, and for the ward in-charge to request replenishment in time when the ward stock is near depletion, allowing adequate lead time for the Procurement Department to procure the item. It should be included in the stock items like other disposables and items of regular use, which are stocked in the Hospital and provided on demand immediately without loss of time.

Periodic CME sessions in the hospital would help reinforce and update knowledge of the different categories of employees on the subject of BMW management and motivate them to comply with the rules and guidelines regarding BMW management. This should be carried at the beginning of new sessions when staff turnover occurs and new personnel join the work force. Regular inspection of the wards and other areas by senior administrators of the hospital, as well as members of the Hospital Infection Control Committee would go a long way to ensure compliance where non-compliance is due to casual attitude of the workers.

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**"If we could give every individual the right amount of nourishment and exercise, not too little and not too much, we would have found the safest way to health."**
**- Hippocrates**

**"There is no medicine like hope, no incentive so great and no tonic so powerful as expectations of something better than tomorrow."**
**Orioson Swett Marden**

**"One of the biggest tragedies of human civilization is the precedents of chemical therapy over nutrition. It's a substitution of artificial therapy over nature, of poisons over food, in Which we are feeding people poisons trying to correct the reactions of starvation."**
**Dr. Royal Lee, January 12, 1951**

**Original article**

# A cross sectional study on knowledge, attitude and practice regarding spacing methods among married women of the reproductive age group in the field practice area of UHTC in surendranagar district

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**Abstract:**

**Background:** India was the first country in the world to launch a National Family Planning Programme with aim to reduce the birth rate to stabilize population. To improve effectiveness of programme, various segments of our population need to have the apt awareness regarding the various spacing methods. This study is aimed at finding out the awareness among the women of the same.

**Aims and objectives:** To find out the knowledge, attitude and practice regarding the use of various family planning methods among the married women and to associate the findings with their socio-demographic profile.

**Materials and Methods:** Sample selection was by simple random technique and size of the sample was 329 in UHTC area (Ratanpar). A cross sectional, house to house survey was carried out. The obtained data was analyzed using SPSS for windows.

**Results:** The couple protection rate in study population was about 51%. About 25.5% of the women were protected by terminal methods, 25.6 % of the women were using spacing methods and 48.9% of women did not use any method of contraception. The number of users of spacing methods increased as the level of education increased. Maximum (31.00%) users of spacing methods were in the age group of 26-30 yrs followed by 15.80% in 31-35 yrs age group.

**Conclusion:** Almost half of the study subjects were not using any form of spacing methods, showing the lack of awareness and inadequate knowledge of the importance of contraception. Thus IEC activities need to be strengthened in educating the women of reproductive age group regarding the various spacing methods.

**Keywords:** KAP, spacing methods, IEC, reproductive age, education

**Introduction:**

Single greatest threat to India's health, political, economic, and social development is uncontrolled population growth. With its population already exceeding 1 billion, it is all set to overtake China and become the most populous country in the world by 2045.[1]

India was the first country in the world to launch a National Family Planning Programme with aim to reduce the birth rate to stabilize population.[1] To improve the effectiveness of the programme, there is need to know awareness, practice & various other factors affecting the use of spacing methods in the different segments of our population because of the vast socio-cultural variation. Spacing methods not only decrease total fertility but also improve the health of mother by the delaying next child birth.[2]

The aim of the study was to find out the knowledge, attitude and practice regarding the use of various family planning methods among the married women and to associate the findings with their socio-demographic profile.

**Materials & methods:**

A Cross sectional study of 329 married women of the reproductive age group was carried out in the field practice area of Ratanpar(U.H.T.C.) Surendranagar District, selection of sample was through simple random technique

Data was collected through a pre-designed and pre-tested questionnaire by house-to-house visit. The consent of all the subjects were taken prior to the study. Permission from the ethical committee was sought before the starting of the study.

Data analysis was done using SPSS 12.0 (Statistical Package for Social Science), Z test & $X^2$ test was used to associate various findings.

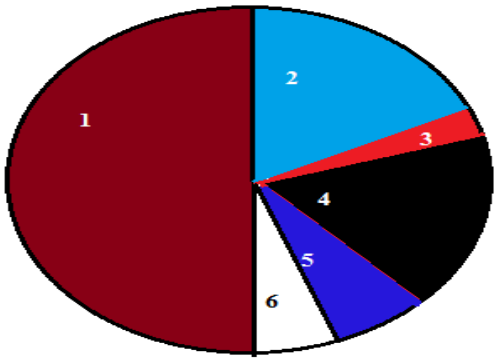
**Results:**

Maximum women in the study were of age between 21-30 years. Most of women were Hindu (85.10%). Out of 329 women 88.4% were housewives

**Table-1: Socio-demographic profile of women**

| SR. NO. | SOCIO-DEMOGRAPHIC VARIABLE (n=329) | NO. | % |
|---|---|---|---|
| 1 | AGE GROUP ( YEARS) | | |
| | 15-20 | 5 | 1.5 |
| | 21-25 | 94 | 28.6 |
| | 26-30 | 102 | 31 |
| | 31-35 | 52 | 15.8 |
| | 36-40 | 40 | 12.2 |
| | 41-45 | 36 | 10.9 |
| 2 | RELIGION | | |
| | Hindu | 280 | 85.1 |
| | Muslim | 33 | 10.3 |
| | Others | 16 | 4.86 |
| 3 | OCCUPATION | | |
| | Housewives | 291 | 88.4 |
| | Laborers | 26 | 7.9 |
| | Service | 12 | 3.64 |

**Figure-1: Distribution of women by the type of contraceptive method used(n=329)**




1. Not using any method (48.9%)
2. Tubectomy (23.7%)
3. Safe period (0.6%)
4. I U D (14%)
5. Condom (5.5%)
6. O C pills (5.5%)

Couple protection rate in the study population is 51%.

25.5% of the women were protected by terminal methods. 25.6% of the women were protected by spacing methods.

48.9% of the women were not using any methods

**Table-2: Reasons for not using any spacing methods (n=161)**

| SR. No. | REASONS | FREQUENCY NO. | (%) |
|---|---|---|---|
| 1 | Not having sex | 3 | 0.9 |
| 2 | Infrequent sex | 8 | 2.4 |
| 3 | Husband away | 9 | 2.7 |
| 4 | Breast feeding | 20 | 6.1 |
| 5 | Infertility | 6 | 1.8 |
| 6 | Husband opposed | 4 | 1.2 |
| 7 | Other opposed | 1 | 0.3 |
| 8 | Lack of Knowledge | 4 | 1.2 |
| 9 | Health concern | 21 | 6.4 |
| 10 | Fear of side effects | 14 | 4.3 |
| 11 | Pregnant | 4 | 1.2 |
| 12 | Menopause | 9 | 2.7 |
| 13 | Hysterectomy | 10 | 3 |
| 14 | Husband expired | 5 | 1.5 |
| 15 | Divorce | 1 | 0.3 |
| 16 | Left to God's will | 48 | 14.6 |
| | TOTAL | 161 | 48.9 |

Most common reason for not using contraceptives was left up to God's will(14.6%) followed by heath concern (6.4%), breast feeding their child (6.1%), fear of side effect (4.3%) and many reasons.

**Table- 3: Distribution as per awareness about contraception (N=329)**

| SPACING METHODS | AWARE | | NOT AWARE | |
|---|---|---|---|---|
| | No. | % | No | % |
| OC Pills | 279 | 84.80 | 50 | 15.19 |
| IUD | 242 | 73.15 | 87 | 26.44 |
| Condom | 290 | 11.85 | 39 | 11.85 |
| Safe period | 2 | 0.2 | 327 | 99.39 |

Only 0.6% of women had knowledge of safe period as a spacing method; and source of information was Doctor. Maximum awareness i.e. 33.7% and 33.1% was of OC pills and IUD respectively, and source was relatives and friends. Condom was known to 45.6% from husbands.

All the women had knowledge regarding at least one spacing method. The maximum users of spacing method were in age group of 26-30 yrs (31%) followed by 31-35 yrs (15.80%). The proportion of users increased up to 35 yrs & than decreased.

**Table 4: Information regarding the sourse of knowledge regarding contraception.**

| SOURCE OF KNOWLEDGE | | OC pills | IUD | Condom | Safe period |
|---|---|---|---|---|---|
| | | No. (%) | No. (%) | No. (%) | No. (%) |
| 1.Health care professional | Doctor | 83(25.2) | 81(24.6) | 25(7.6) | 2(0.6) |
| | Nurse | 17(5.2) | 12(3.6) | 51(15.5) | 0(0.0) |
| | HWs | 3(0.9) | 7(2.1) | 2(0.6) | 0(0.0) |
| 2. Relatives | Husband | 13(4.0) | 12(3.6) | 150(45.6) | 0(0.0) |
| | Mother | 2(0.6) | 0(0.0) | 0(0.0) | 0(0.0) |
| | Friends/ Relatives | 111(33.7) | 109(33.1) | 21(6.4) | 0(0.0) |
| 3. Others | AWWs | 8(2.4) | 17(5.2) | 9(2.7) | 0(0.0) |
| 4. IEC | Advertisements | 42(12.8) | 41(12.5) | 32(9.7) | 2(0.6) |

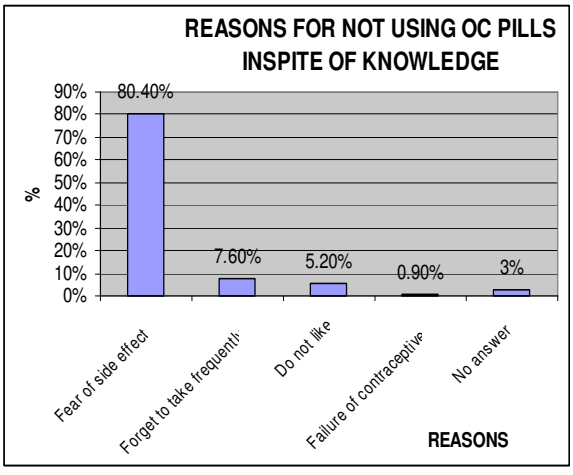
**Table-5: Association between literacy and use of contraception**

| EDUCATION | USAGE OF CONTRACEPTIVE METHODS | | | |
|---|---|---|---|---|
| | STERILIZATION | SPACING METHODS | NOT USING ANY METHODS | TOTAL |
| ILLITRATE | 13 | 6 | 38 | 57 |
| PRIMARY | 33 | 29 | 99 | 161 |
| SECONDARY | 23 | 17 | 13 | 53 |
| HSC, GRADUATE AND ABOVE | 15 | 32 | 11 | 58 |
| TOTAL | 84 | 84 | 161 | 329 |

The association proved statistically highly significant. $X^2$=49.834, DF=6, p=0.0001

The no. of users was significantly more among literates as compared to illiterates women. The spacing contraceptive users increased as the level of education increased.

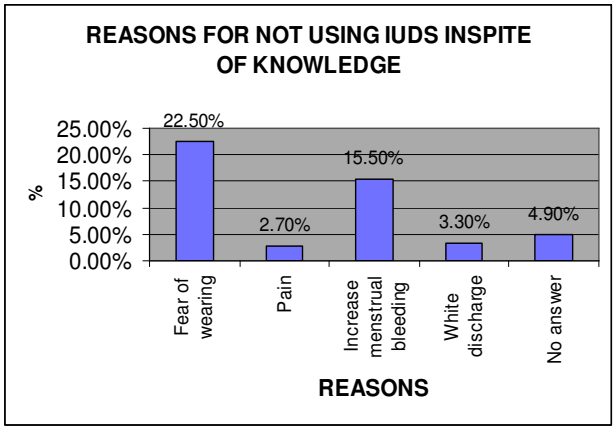
**Figure-2: Reasons for not using OC pills inspite of knowledge:**




Most common reason for not using OC pills inspite of awareness was fear of side effects(80.4%) followed by "forget to take" (7.6%) and "do not like" (5.2%), while the "failure of contraception" was answered by only 3 women.

Most common reasons for not using IUDs are fear of wearing (22.5%) & increased menstrual bleeding (15.5%)

**Figure-3: Reasons for not using IUDs inspite of awareness**




Most common reasons for not using IUDs were fear of wearing (22.5%) and increased menstrual bleeding (15.5%)

**Discussion :**

In the present study, the couple protection rate was 51%, which is less as compared to NFHS-III data for Gujarat is 66.6% [3] and 53% in another study conducted by N.K.Saini Et al [2] .However the users of spacing methods are more in present study. Availability of spacing methods is better in the area under supervision of UHTC. Cu T (14%) was most popular spacing method being used followed by OC pills & condom. The possible explanation

for popularity of Copper T could be that it is a one time procedure & gives protection for longer time. The most important reason for not using spacing methods was that those who were not using any contraceptive methods perceived risk of pregnancy more. Desire for more children is a significant factor, also found in another study conducted by Alagh Et al [5] . Maximum users of spacing methods were women with age 25-35 years. Use was low in younger age groups. Studies conducted by Singh Et al[4] and Alagh Et al[5] also showed low incidence of use of spacing methods in younger couples. This shows that intensive effort are needed to popularize spacing methods among younger couples, as this is a more fertile group. Maximum users were among those who knew all three approved methods of contraception. Non users were more in the group who were having knowledge of only one method. The present study indicates a need to motivate the non-user women who desire more children to adopt a small family norm. The lactating mothers (6.1%) should also be educated about the fact that breast feeding alone cannot prevent conception. Knowledge regarding spacing methods was universal. User rate was significantly more in those having knowledge of all three approved spacing methods of contraception showing that the value of literacy is increasing the acceptance of spacing methods.

**Conclusion & recommendations:**

Almost half of the study subjects were not using any form of spacing methods, showing the lack of awareness and inadequate knowledge of the importance of contraception.

Improve access to family planning to ensure effective implementation. To strengthen the IEC activities by educating the women of reproductive age group regarding the various spacing methods. Good quality services in the vicinity of their residence. Meet the unmet needs for spacing methods on the priority basis.

**Acknowledgement:**

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**"The cell is immortal. It is merely the fluid in which it floats that degenerates. Renew this fluid at regular intervals, give the cells what they require for nutrition, and as far as we know, the pulsation of life can go on forever."**
**Dr. Alexis Carrell - Nobel prize winner**

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## Original article

# Incidence of depression in chronic low-back pain – A hospital based study

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**Abstract**

**Background:** Depression and Chronic Low-back pain (CLBP) are two contrast ailments which affect different parts of a human body. Depression is a psychiatric condition while low-back pain is a distinctly physical condition with many physically presentable symptoms. This study was conducted to investigate the co-morbidity of depression among the patients suffering from chronic low-back pain, who visit an orthopedic surgeon in a hospital of Gujarat, and study the effect of Socio-demographic factors.

**Method**: Questionnaire based survey of depression in chronic low- back Pain in hospital setting. The study population consisted of patients who visited an orthopedic surgeon for complaint of Chronic low-back pain, having pain for atleast last 3 months, and age 30 years or above.

**Result**: Out of the 107 patients, 59 patients were found positive for depression using the BDI scale. Hence, 55.14% of people suffering from chronic low-back pain also suffered from clinical depression. This percentage also included the patients in whom there was a presence of confounding factors, and females who were currently going through menopause.

**Conclusion:** The incidence of depression in CLBP was observed to be 55.14% which is higher than reported in previous studies.

## Introduction

Depression and Chronic Low-back pain (CLBP) are two contrast ailments which affect different parts of a human body. Depression is a psychiatric condition while low-back pain is a distinctly physical condition with many physically presentable symptoms.

Research practices indicate that depression and CLBP could be inter-related because both these ailments have been found to co-exist in a lot of patients. The correlation between these two conditions has been studied by researchers since decades but till date no substantial evidence has been able to validate the exact relationship between the two. However, the disease burden of both is significantly towering and it becomes important to understand the relationship between the two[1,2,3]. The lack of clear incidence rates and contrasting results of many researches, keeps the curiosity burning about the ground reality of this co-relation[1,4].

Depression and pain share biological pathways and neurotransmitters, which has implications for the treatment of both concurrently. A model that incorporates assessment and treatment of depression and pain simultaneously is necessary for improved outcomes[5]. A simpler explanation for this is that pessimistic thoughts activate some specific areas in the brain which causes the person to give more attention to the pain and increases the amplitude of pain felt[5].

Epidemiologically, depression and chronic low-back pain are among the most prevalent disorders, worldwide. They can affect both, the young and the old. CLBP is a condition which weakens and disables the person physically, while depression is a disease which can cause disability in the emotional and mental aspects. The disease burden for both these conditions are already very high and are expected to grow in the future[6].

Usually it is noticed that any of these conditions may become the causative factor for the other and can even exacerbate each other[7,8]. Patients with depression often present with a complex set of overlapping symptoms, including emotional and physical complaints. Physical complaints typically include medically unexplained pain[9]. Although it is generally understood that depression and painful symptoms are common co-morbidities and that their combination is costlier and more disabling than each of them alone.

It becomes especially important to understand the liaison between these two conditions, looking at the fact that half of the individuals suffering from major depression fail to be diagnosed by their physicians[3,10] and it has also has been scientifically proved in a minimum of 2 extensive studies that patients with depression who present with physical symptoms such as pain are particularly likely to receive an inaccurate diagnosis[11,12].

The progression of low-back pain for long time would result into many routine changes and

adversely affect the individual's state of mind[13]. The reverse connection, i.e. depression leads to low back pain has been studied by researchers more recently. They have studied how the psychological diseases like depression and anxiety can lead to low back pain in such patients. This two way connection between depression and low back pain has been demonstrated through many studies and one such systematic review of these studies revealed that in adult males, 42% patients suffered primarily from depression which leads to chronic low back pain, while 58% had a reverse cycle of chronic low back pain causing depression[14]. A similar study by Polatin et al. revealed that 39% CLBP patients suffered from depression[15]. While a study by Linton (2000) revealed the other way connection that wherein 14 out of 16 studies indicated that depression increases the chances for development of low back pain[2]. The problem, hence, lies in the fact that in majority of such co-morbid cases, only one out of the two ailments is diagnosed and treated by the physician. The other one remains undetected and hence untreated and it doesnot allow the cure of the diagnosed ailment too. Practically, such treatment failures would be blamed on the non-compliance by the patient and would shift the focus from the ideal treatment. This is frustrating to both the patient and the physician. Therefore, it becomes imperative to assess both physical and psychological cause in order to provide a rational and effective medical treatment[15].

This study was conducted to investigate the co-morbidity of depression among the patients suffering from chronic low-back pain, who visit an orthopedic surgeon in a hospital of Gujarat, and study the effect of Socio-demographic factors.

**Method**

**Study Design** was Questionnaire based survey of Depression in Chronic low- back Pain. This project was designed to study the incidence rate of depression in chronic low-back pain patients attending orthopedic OPD.

The study population consisted of patients who visited an orthopedic surgeon for complaint of Chronic low-back pain, having pain for atleast last 3 months and aged 30 years or above. These patients were initially diagnosed for CLBP by the doctor as per his routine practice. They were then screened through the Inclusion /exclusion criteria and those found eligible were then explained about the study and given the Informed consent form to read, understand and sign.

**Inclusion Criteria**

- Minimum 3 months duration of chronic back pain
- Age 30 years and above (This excludes the early onset depression patients)

**Exclusion Criteria**

- Severely ill and bed ridden patients of back pain
- Pregnant and lactating females
- History of depression before onset of low-back pain
- Patients who are not able to understand both English and Gujarati language.

**Sample size**-The probable incidence rate of depression was calculated to be 40% in patients of chronic low-back pain. The allowable error was taken as 20% and the confidence interval was 95%. The design effect for this study was 5. The sample size was calculated from the formula:

N= [4pq/(L)2] x design effect

Here, p is prevalence rate, q is 1-p and L is the all owable error, in this case 0.2.

Hence, Sample size , N = [4x 0.4x 0.6/ (0.2)2 ] x 5=120.

The study was done in a clinical setting of an orthopedic surgeon. There were three procedures through which a patient would pass if he/she qualifies the inclusion criteria.

1. Diagnosis by Orthopedic surgeon Investigator) – Chronic low-back pain Diagnosis form
2. Briefing session about the study, signing the Informed consent form.- Informed consent form
3. Consultation with Psychiatrist (Investigator) or Trained research personnel (Clinical research co-ordinator) for diagnosis of depression. Involved taking medical and family history, socio-demographics and filling the questionnaires.- Case report form(CRF), BDI-English[16] or Gujarati version.

The patients were free to withdraw their participation from the study at any stage of the study. This study involved only one time contact with the patient for the purpose of the study. Hence, the patients were free to deny from answering the questionnaire even after signing the Informed consent form.

The socio-demographic data of the patient consisted of age, sex, education, occupation, monthly income of family head, type of family (joint/ nuclear) and no. of children. For classification based on Socioeconomic status, Kuppuswamy classification was used. Thus, total 107 patients were enrolled in study over 4

months. The collected data were analyzed with Microsoft office Excel 2007.

**Results**

Out of 107 patients who participated in this study, 38 were male and 69 female. The age distribution of the patients was as shown in the Table 1.

**Table 1: Population distribution as per age and sex**

| Age group | No of patients | Male | Female |
|---|---|---|---|
| 30-40 | 42 | 20 | 22 |
| 41-50 | 23 | 6 | 17 |
| 51-60 | 29 | 8 | 21 |
| 61-70 | 12 | 3 | 9 |
| 71-80 | 0 | 0 | 0 |
| 80-90 | 1 | 1 | 0 |
| Total | 107 | 38 | 69 |

Out of the 107 patients, 59 patients were found positive for depression using the BDI scale. A score of 8 to 15 indicated moderate depression and >15 indicated severe depression. The outcome of the BDI was considered most substantial for the purpose of this study. Patients found positive in BDI and negative in the symptoms checklist were still considered positive for depression. Thus the rate of incidence from BDI was calculated as:

Incidence rate = 59 x 100 / 107 = 55.14%

Out of 107 patients, 52 patients were found positive for depression from the symptoms check list and out of these, 50 patients demonstrated somatic symptoms of depression. 2 patients did not show any somatic symptoms in spite of having diagnosed for depression from the BDI and symptoms checklist.

However considering the criteria for depression diagnosis for this study, 9 patients out of 107 were found depressed. 12 patients were found who were depression positive from BDI but not from the symptoms checklist. However these patients were still considered depressed according to the criteria specified for this study. Hence, 55.14% of people suffering from chronic low-back pain also suffered from clinical depression. This percentage also included the patients in whom there was a presence of Confounding factors, and females who were currently going through menopause.

**Confounding factors:** The number of patients found positive for depression without presence of confounding factors was 39. The remaining 20 had some or the other co existing confounding factors for depression. These confounding factors were mainly some coexisting chronic diseases like, hypertension, diabetes or other painful conditions. Other confounding factors seen in a few patients were long term disability, social and family issues and recent trauma or surgery.

Out of the 59 patients who were depression positive, 45 were females. The menopausal status of these patients was also recorded. Females having no menopause as well as those having post menopausal period > 5 years were not considered under menopausal depression. Only females with ongoing menopause period or less than 5 years of menopause were considered under menopausal depression. Out of 45 depressed females, 22 were post menopausal women who had >5 years of post menopausal period while 10 females had a current menopause. That is, 22.22% of females with chronic low-back pain had a depression which could be a result of Post menopausal symptoms.

**Back pain diagnosis and duration:** Out of 59 depressed patients with CLBP, 39 patients were diagnosed with the spinal disorder, Lumbar Spondylosis alone while 10 other had a combined diagnosis of Lumbar spondylosis with other disorders like osteoporosis, Cervical spondylosis, or Spinal canal stenosis. The remaining 10 were diagnosed with other ailments like Slip disc, myofacial back pain, lumbar strain, ankylosing spondylosis, non-specific lowback pain or fibromyalgia. Hence, 49 out of 59, i.e. 83% depressed patients had the diagnosis of Lumbar spondylosis.

Duration of back pain ranged from upto 6 months to > 10 years in the studies sample. 34 out of 59 depressed patients had duration of low back pain upto 1 year while 23 patients were suffering from low back pain since 2 to 5 years. Only 2 patients had duration of low back pain more than 5 years.

**Severity and classification of depression**: According to the rating given in the abridged BDI scale, a score between 8 to 15 was considered as- Moderate depression, while > 15 was considered as –Severe depression. Patients falling under these two classifications were considered depressed for the purpose of this study. A score of less than 8 on abridged BDI was considered Mild Depression and such patients were not considered depressed. The severity wise classification of the patients is shown in Table 4.2 according to which, 32.7 % of total population studies had mild depression while 22.4% had a case of Severe depression.

**Table 2: Severity of Depression and its incidence rate**

| No. of patients | Mild depression- considered 'not depressed' in the study | Moderate depression | Severe depression |
|---|---|---|---|
| | BDI score - <8 | 8 to 15 | >15 |
| 107 | 48 | 35 | 24 |
| Percentage (%) | 44.8% | 32.7% | 22.4% |

**Table 3: Age groups wise incidence of Depression**

| Age group | Depressed | Non depressed | Total | Incidence rate (%) |
|---|---|---|---|---|
| 30-40 | 25 | 17 | 42 | 59.5 |
| 41-50 | 12 | 11 | 23 | 52.1 |
| 51-60 | 15 | 14 | 29 | 51.72 |
| 61-70 | 6 | 6 | 12 | 50 |
| 71-80 | 0 | 0 | 0 | 0 |
| 80-90 | 1 | 0 | 1 | 100 |
| Total | 59 | 48 | 42 | 55.14 |

**Sex wise incidence of depression:**

Out of 107 patients, 38 were male and 69 were female. Among the 59 depressed patients, 14 were male and 45 were female. In order to calculate the rate of incidence in male and female group, the following formula was used:

Incidence rate in x group = (no. of depressed patients in X group/total no. of patients in X group) x 100

By using this equation,

Incidence rate in males: Im = 14/38 x 100 = 36.8%

Incidence rate in females: If = 45/69 x 100 = 65.21%

Hence the incidence rate of depression among male was 36.8% and among female was 65.21%.

***Socio-economic status (SES) wise incidence of depression:***

Socio-economic status (SES) was calculated from the Kuppuswamy scale for SES. Table 4.4 shows the number of depressed and non depressed patients in each SES class with the incidence rates.

**Table 4: SES and incidence of depression**

| SES class (score) | Lower (<5) | Upper lower (5 - 10) | Lower middle (11-15) | Upper middle (16-25) | Upper (26-29) |
|---|---|---|---|---|---|
| Depressed | 8 | 31 | 15 | 10 | 0 |
| Non-depressed | 4 | 21 | 10 | 5 | 3 |
| Total | 12 | 52 | 25 | 15 | 3 |
| Incidence(%) | 66.66 | 59.61 | 60 | 66.66 | 0 |

The incidence of depression in Lower and upper middle class was 66.66%, in upper lower class was 59.61% whereas in lower middle class it was 60%. The upper class showed 0% incidence rate of depression. However there were only 3 patients falling in this class. Highest number of patients (52) belonged to the Upper lower class. The lower middle class also comprised of 25 patients.

To summarize the results, the primary rate of incidence of depression in CLBP was found to be 55.14% including those with confounding factors. The incidence of probable menopausal depression in females with CLBP was 22.22%. The incidence rates of depression in relation to age, sex and SES class are demonstrated above.

**Discussion**

Overall good health of an individual depends on two major components: the Mind and the Body. Both these components need to be in harmony with each other in order to achieve a healthy state. Disturbance in any one of the two components would lead to loss of harmony between the two and would have a negative impact on the other component. This is what this study tries to establish.

The incidence rate of depression in chronic low back pain was found to be 55.14%. It was calculated from a simple mathematical formula for percentage. It depicts the extent of co-morbidity of depression with CLBP. As mentioned above, the relationship between depression and pain is established through this research. This confirms that depression was

deeply rooted in the diagnosed patients. Somatic symptoms appear only at a stage when the depressed state starts affecting the biochemical processes of the body which is a sign of severity of depression. However, the incidence rate found by this study is higher than the average incidence rates reported in the literature. The reason for a higher incidence rate could be attributed to a number of factors. The first one is patient population which was majority rural, had less exposure to medical facilities, and had a low literacy level and also majority of population being from lower and upper lower class. These population characteristics itself appear to be vulnerable to depression. Another factor contributing to a high incidence rate is the presence of confounding factors.

Confounding factors, described previously were assessed in the depression positive cases. If we remove the patients with confounding factors from the depression positive cases then the incidence rate of depression happens to be 36.4%. It means that although 55.14% of population suffered from depression, only 36.4% were the confirmed cases of depression and CLBP co-morbidity. The remaining cases of depressed patients may or may not have the CLBP as the root cause of depression. This result indicates that as depression is highly prevalent in CLBP, the presence of other confounding factors is also a common scenario which boosts the incidence of depression.

**Limitations of the study**

The limitations of this research work were identified as follows:

a. Incomplete patient recruitment -The sample size calculated for the study was 120 patients of CLBP but only 107 patients were recruited during the course of this study. The major limiting factor was the time. The study was conducted over 4 months

b. Restricted population exposure - The study was done in a small region at a total of 3 different centers and the patients were all recruited from only one Orthopedic surgeon.

c. Unequal population distribution - Majority of the population was rural and of the female sex.

The conclusion of this study should be framed while keeping in mind these limitations and its impact on the results.

**Conclusion**

The incidence of depression in CLBP was observed to be 55.14% which is higher that reported in previous studies. There was a clear presence of confounding factors along with CLBP in depressed as well as non depressed patients which influenced the incidence rate. Socio-demographic factors like age, sex and socioeconomic status were assessed in detail. Age and sex of patients did not affect the incidence of depression in CLBP but the socio-economic status had a considerable influence. The incidence of depression in upper lower class and upper middle class was higher than average, so the patients in these groups must have more contributing factors for depression.

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**"Warmth, moisture, food -- these are the causes that activate latent germs and arouse them to activity. They exist, all except the food, in the mouth, nose and throat at all times. The food is thrown out into these, as excretions, in disease. The germs feed on the excretions. They are scavengers. They were never anything else and will never be anything else. They break up and consume the discharge from the tissues. This is the function ascribed to germs everywhere in nature outside the body and is their real and only function in disease. They are purifying and beneficial agents. The medical profession has worked itself into hysteria over the germ theory and is using it to exploit an all too credulous public. Germs are ubiquitous. They are in the air we breathe, the food we eat, the water we drink. We cannot escape them. We can destroy them only to a limited extent. It is folly to attempt to escape disease by attempting to destroy or escape germs. Once they are in the body, the physician has no means of destroying them that will not, at the same time, destroy the patient. We cannot avoid germs. We must be proof against them. We have to accept them as one of the joys of life."**

**Dr. Herbert Shelton**

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Original article

# Capacity building of student volunteers to influence infants & young child feeding behaviors of urban mothers.

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**Abstract**

**Background:** The study attempted to build capacities of NSS student volunteers as community mobilizers so as to impart knowledge on the issues related to optimal infant and young child feeding (IYCF) practices over a period of one month (four days/week). Further, they were expected to sequentially improve community participation by involving community change agents (CCAs) who in turn would build their own capacities for IYCF practices.

**Method:** The capacity building of both the mobilizers and the CCA's was done with the help of pre-tested modules. Formative research was done to assess the existing knowledge, attitude and practices of the mothers regarding causes and consequences of malnutrition, feeding and caring practices for children. The Positive deviant children were identified by the CCA's with the help of mobilizers using the "Positive Deviance Inquiry Check list". The positive deviant practices identified in these children were promoted during capacity building sessions of CCA's.

**Results:** The study demonstrated that NSS volunteers could be effectively used to build the capacities of the selected change agents. Capacity building of the change agents showed remarkable improvements not only in their knowledge about healthy feeding and caring of children (5% vs. 90%) but also regarding practices related to healthy feeding and caring (2% vs. 80%). The reinforcement at monthly interval was effective to sustain the motivational levels of change agents. *Conclusion:* NSS volunteers could be mobilized to work in the communities along with CCA's to improve the optimal IYCF practices.

***Key Words:*** Community Change Agents (CCA's), Capacity Building, IYCF practices

**Introduction:**

An important correlate of child nutritional status is nutrient intake, which in turn depends on the nature and duration of feeding practices. Feeding practices are especially critical during the first few days and months of an infant's life, since growth is faster and protection against illnesses and infections is most needed during this crucial period. Ideally, a baby should be put to the mother's breast immediately after birth. However, NFHS-3[1] data indicate that nearly one-half of Indian babies have to wait to be breastfed for more than a day after they are born. This is how the cycle of child malnutrition begins very early in an Indian child's life. The delay in breastfeeding is often related to an incorrect perception that the first breast milk (colostrum) is an inferior food, early termination of exclusive breastfeeding and late and early introduction of complementary and supplementary feeding, mother's perception of not producing sufficient quantities of milk due to their poor nutrition and heavy workload, etc.

This clearly suggests that the major burden of child malnutrition occurs in children less than 2 years of age and the major causes being poor IYCF practices. This consequently also reinforces the point that, capacity of the community needs to be built by specially focusing on caring and feeding practices of the mothers and children.

**Methods:**

The study was carried out in 2 AWC's covered by ICDS centers in urban Baroda. Mobilizers (n=10) for the study were community volunteers under the National Service scheme (NSS). The major role of the mobilizers was to build capacities of the selected Community Change Agents viz. mothers of children under 2 years of age, volunteers (n=58) so as to enhance community participation and bring about improvement in the knowledge and practices of mothers of children <2 years of age regarding optimal IYCF practices.

The baseline knowledge of the selected mobilizers and CCAs regarding IYCF practices was assessed with the help of semi-structured pre-tested KAP questionnaire. The capacity building sessions of the mobilizers was conducted 4 days/week for a month. Well

nourished children sharing the same economic and social environment were identified by the CCA's with the help of mobilizers using the *"Positive Deviance Inquiry Check list"*[2] at baseline.

Positive Deviance (PD) is a development approach that is based on the premise that solutions to community problems already exists within the community[3]. The term "positive deviance" has been defined as "adaptive responses for satisfactory child growth under harsh economic circumstances such as food scarcity, while "negative deviance" is described as "the failure of children to grow satisfactorily, even under good economic conditions". The CCA's were demonstrated how to identify PD practices among their community that led to good nutrition using a pretested checklist that was prepared by the mobilizers.

The checklist was prepared by mobilizers with the help of the investigator. It was prepared keeping in mind the positive feeding, caring and health seeking behaviors of the mother's viz. checking the practices of mothers of well nourished children against the undernourished children and finding the reasons of undernourishment. The identified PD practices were used for promotion during the capacity building sessions of the CCA's.

The following PD practices were identified by CCA's:

Good feeding practices

Initiation of breastfeeding within one hour

- Colostrum given
- Complementary foods given 4-5 times a day
- Good caring practices
- Active feeding
- Hand washing before and after feeding
- Good body hygiene
- Good health seeking practices
- Seeking treatment of the sick child at health center
- Giving ORS when child gets diarrohea
- Child fully immunized
- Child taken for growth monitoring every month at AWC

Capacity building sessions of the CCA's was conducted for 2 days by the mobilizers and reinforcement of the capacity building sessions was done every month. This was continued for a period of four months. The impact of capacity building intervention of the mobilizers and CCA's was assessed by studying the improvements, if any on the KAP scores of the CCA's. Semi-structured questionnaire and observation method were used to assess positive changes in feeding practices of the mothers after the period of four months.

**Results:**

**Efficacy of involving students as community mobilizers :**

Knowledge of mobilizers regarding various nutrition and health terms and practices was almost nil at the baseline. viz. definition of LBW baby, IYCF practices (viz. exclusive breast feeding till 6 months, time of initiation of complementary foods, quantity and frequency of complementary foods), importance of increase in weight gain during pregnancy and its effects on birth outcome, early registration of pregnancy, antenatal care and its components, PD concept and identification of PD practices. Knowledge of the mobilizers improved significantly (100%) for all the messages after the capacity building sessions, which suggested that capacities of the mobilizers were built to forward the same messages to the change agents.

**Efficacy of capacity building of the community change agents by the mobilizers**

The demographic profile of the two anganwadi centers selected showed that the total number of households were 400 having a population of 95 mothers of children under two years of age; 23 pregnant and 35 lactating women, of which a total of 58 mothers were selected and motivated to act as CCA's.

Drawing and dialogue was conducted to explore the various perceptions of the mothers with respect to healthy diet and malnutrition. Need for food was reported by, majority (70%) *"we get strength"* followed by 65% who reported *"we should eat to fill our stomach"* while 55% responded as *"we should eat to keep body health"*. Perceptions regarding a balanced diet showed that 75% of them could draw dal, rice, roti, vegetables in a plate. However when asked about what should be included in a child's diet, 65% of mothers could only answer milk, khichdi, etc. There was a lack of mention of fruits and vegetables. *"Not eating food"* was the most common (80%) perception of the CCA's regarding the cause of malnutrition. Other perceptions with regards to causes of malnutrition included diseases/illnesses. According to most of the mothers, most common (73%) sign of malnutrition was *"child cannot eat much",* followed by *"child falls ills*

*frequently"* (63%) and *"child cries a lot"* (57%).

**Impact of Capacity Building of CCA's by the mobilizers on knowledge regarding optimal IYCF:**

Remarkable improvements in the knowledge of CCA's were observed post intervention. At baseline majority (58.3%) of CCA's lacked the knowledge regarding definition of Low Birth Weight baby which increased to 70 % after capacity building.

Table 1: Change in Knowledge of Mothers Regarding Breast Feeding Practices

| Sr. No. | Response | Percent Response | | $\chi^2$ Value |
|---|---|---|---|---|
| | | Pre | Post | |
| 1. | Initiation of breast feeding | | | 30.12 |
| | Soon after delivery | 15.03% (9) | 86.8% (52) | |
| | Within 2 hours of delivery | 31.7% (19) | 11.69% (7) | |
| | After 2 days | 5.01% (3) | 1.67% (1) | |
| | After 1 week | - | - | |
| 2. | Ideal food for the child after birth | | | 22.45 |
| | Honey | 63.4% (38) | 25.0% (15) | |
| | Janam Ghutti | - | - | |
| | Mother's milk | 15.03% (9) | 65.1% (39) | |
| | Other liquids (eg.: Sugar water, Jaggery water) | 21.7% (13) | 10.02% (6) | |
| 3. | Duration of exclusive breast feeding | | | 56.51 |
| | 4 Months | 95.1% (57) | 25.0% (15) | |
| | 6 Months | 5.01% (3) | 75.2% (45) | |
| | 1 Year | - | - | |
| 4. | Including water before 6 months | 78.5% (47) | 45.1% (27) | |
| 5. | Conditions in which water is fed before 6 months | | | 19.14 |
| | Diarrhoea | 50.1% (30) | - | |
| | Summer | 25.0% (15) | 15.03% (9) | |
| | Fever | 5.01% (3) | - | |
| | Thirst | 20.0% (12) | - | |

* Figures in ( ) indicates number of subjects

At baseline knowledge regarding the breastfeeding was sub optimal which changed drastically post intervention (Table I). Similar picture was seen with regards to baseline knowledge regarding complementary feeding which also changed positively post intervention (Table 2).

*Immunization*

Knowledge about the felt needs of the mothers for immunization was good at baseline (96%) which remained so after intervention. However considerable improvement in the knowledge regarding various vaccines was observed. Majority of them knew about all the vaccines including Vitamin-A supplementation which only 35% of mothers knew at the baseline vs. 82% post intervention.

**Table 2: Change in Knowledge of Mothers Regarding Complementary Feeding and Introduction of Family Food**

| Sr. No. | Response | Percent Response | | $\chi^2$ Value |
|---|---|---|---|---|
| | | Pre | Post | |
| 1. | Actual age of introduction of complementary foods | | | 43.79 |
| | 4 Months | 68.47% (41) | 1.67% (1) | |
| | 6 Months | 11.69% (7) | 93.52% (56) | |
| | 7 Months | 16.7% (10) | 5.01% (3) | |
| | 8 Months | 3.34% (2) | - | |
| | 10 Months | - | - | |
| 2. | Amount (Quantity) of Complementary food to be started at 6 months | | | 24.62 |
| | ½ Katori | 85.17% (51) | 90.18% (54) | |
| | 1 Katori | 11.69% (7) | 5.01% (3) | |
| | 2 Katori | 3.34% (2) | 5.01% (3) | |
| 3. | Frequency of feed | | | 34.19 |
| | 2 Times | 80.16% (48) | 5.01% (3) | |
| | 3 Times | 13.36% (8) | 6.68% (4) | |
| | 4 Times | 6.68% (4) | 86.64% (52) | |
| 4. | Types of foods given | | | 54.31 |
| | Dal Water | 11.69% (7) | 1.67% (1) | |
| | Mashed Dal, Rice, Roti, Vegetable | 5.01% (3) | 83.5% (50) | |
| | Khichadi | 63.46% (38) | 10.02% (6) | |
| | Other | 20.04% (12) | 5.01% (3) | |
| 5. | Age of introduction of family diet | | | 45.35 |
| | 9 Months | 90.18% (54) | 1.67% (1) | |
| | 1 Year | 5.01% (3) | 88.51% (53) | |
| | 1½ Year | 1.67% (1) | 5.01% (3) | |
| | 2 Years | 1.67% (1) | 3.34% (2) | |
| 6. | Amount of food 1-2 year old should eat | | | 43.63 |
| | ½ amount of mothers diet | 15.03% (9) | 85.17% (51) | |
| | ¼ amount of mothers diet | 10.02% (6) | 10.02% (6) | |
| | No idea | 30.06% (18) | - | |
| | Others | 45.09% (27) | 5.01% (3) | |

* Figures in ( ) indicates number of subjects

*Health Seeking Practices*

Impact of Capacity Building of CCA's by the mobilizers on Practices related to optimal IYCF. At baseline the practices documented using a questionnaire and observed regarding breastfeeding and complementary feeding was poor ranging from 5% to 35%. However remarkable improvements in knowledge about all these important key issues of complementary feeding practices was observed post intervention which ranged from 77 to 94% (Table 3).

At baseline surrounding cleanliness was observed only in the houses of 12 % of the mothers. But after having known the impact of unhealthy surroundings on the health of the child more attention was paid by the mothers to cleanliness of surroundings (85%). Personal hygiene practices improved such as regular bath to the child (11% vs. 80%); hand washing of the mother and the child before and after eating/feeding (16% vs. 87%). The use of sun sterilized utensils for feeding the child was also observed (17% vs. 96%)

**Table 3: Change in Practices of Mothers after Capacity Building**

| Sr. No. | Practice | Percent Response | | $X^2$ value |
|---|---|---|---|---|
| | | Pre | Post | |
| 1. | **Breast Feeding** | | | - |
| | Introduction of breast milk soon after birth (normal delivery) | 25% (1) | 75% (3) | |
| | Introduction of breast milk after 1 hour (caesarian) | - | 25% (1) | |
| | Colostrum fed | 25% (1) | 100% (4) | |
| | Breastfeeding during illness | 80% (47) | 98% (54) | |
| | Exclusive breast feeding for 6 months | 24% (5) | 58% (30) | |
| 2. | **Complementary Feeding** | | | 67.13 |
| | Introducing complementary food at 6 months | 10% (5) | 86% (45) | |
| | Continuation of breast milk along with complementary food after 6 months | 35% (18) | 86% (45) | |
| | Giving semi solid mushy foods from all food groups | 5% (2) | 94% (49) | |
| | Increase frequency of complimentary foods with age | 15% (8) | 92% (48) | |
| | Active feeding | 15% (8) | 77% (40) | |

* Figures in ( ) indicates number of subjects

**Discussion:**

To tackle the problem of malnutrition, many programs have been initiated by the government of India. ICDS is the first largest program which has been implemented to combat malnutrition, since 1975. Inspite of it being a direct nutrition and health intervention program in the world for children and pregnant, lactating women, the rates of malnutrition are still alarmingly high.

Evaluation of the program has revealed deficiencies in many areas such as poor utilization of services in the age group of less than three years, lack of community participation, unsatisfactory referral services and improper growth monitoring and promotion.

Change is possible, if community involvement and ownership is increased and the capacities of the community members to identify, analyze and act to combat malnutrition in their communities is built. A successful capacity building initiative was undertaken by Vietnam by adopting the concept of "Positive Deviance". Positive Deviance (PD) is based on the hypothesis that solutions to the community's problems requiring social and behavioral change can be identified within the community by identifying those individuals who already exhibit the desired behaviour[3].

In order to decline malnutrition rates substantially in children, exclusive breast feeding and proper complementary feeding practices must be emphasized. The World Health Assembly and the UNICEF Executive Board unanimously endorsed the Global Strategy for Infant and Young Child Feeding in 2002 that aims to revitalize world attention to feeding practices that have an impact on the nutritional status, growth, development, health and thus the very survival of infants and young children[4].

The present study demonstrated remarkable improvements in knowledge and practices of mothers regarding infant feeding practices after capacity building intervention. The capacity building intervention was successful in increasing the knowledge of mothers regarding healthy feeding and caring practices (5% vs. 90%).

Significant changes in infant and young child feeding and caring practices (2% vs. 80%) of the mothers was also observed after intervention. In the present study knowledge of exclusive breast feeding for 6 months was uncommon (5%). Similarly, NFHS-2 (2000)[5] also reported that in Gujarat only 41.2% of children were exclusively breast fed till six months, while NFHS-3 (2005)[1] the number increased to 46%. Another study conducted by Parkar (2001) in urban Baroda also demonstrated that the practice of exclusive breast feeding was uncommon (15%)[6].

Early introduction of complementary feeds (at 4 months) was observed at baseline which supports the results of earlier study conducted in urban slums of Baroda. However, earlier studies conducted in Baroda also revealed that more than one – third of slum dwelling women perceived that the child should be weaned at one year, as they believed that child should be weaned to solid foods only when they start teething[7].

The data also demonstrated that capacity building of the NSS volunteers who could be used as mobilizers was a useful strategy and these mobilizers could disseminate the key messages in the community quite effectively and in turn their own capacities on nutrition and health related issues were also built. The capacity building of the change agents in the community can lead to positive gains in knowledge and has the potential to influence behavioral change in the community and improve nutritional status of the vulnerable groups in the long run.

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**"To enjoy good health, to bring true happiness to one's family, to bring peace to all, one must first discipline and control one's own mind. If a man can control his mind he can find the way to Enlightenment, and all wisdom and virtue will naturally come to him."**

**Buddha**

Original article

# An educational intervention study of breast self examination (BSE) in 250 women beneficiaries of urban health centers of west Zone of Ahmedabad

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**Abstract:**
A Health Education (HE) Intervention study of BSE in 250 women beneficiaries attending the Urban Health Centers of Ahmedabad was done. Pre-test assessment revealed that awareness about various risk factors and screening methods of breast cancer was relatively inadequate. However, three months after the intervention, there was not only significant improvement of knowledge, but improvement in BSE practices was also observed amongst these women.
The knowledge about increasing age, nulliparity, age at first pregnancy >30 years, age at menopause >50 years, family history of breast cancer, intake of oral contraceptive pills, obesity, lack of breast feeding, cancer in the second breast as risk factors of breast cancer had significantly increased by 37% to 68% in the post- intervention test as compared to the baseline (pre-test). Similarly knowledge of BSE and Mammography as screening methods of breast cancer also increased by 74% and 64% women respectively in the post test. Compliance to the regular and correct BSE was observed in nearly 20% of all women after three months.
**Keywords:** Risk factors of breast cancer, Health Education (HE) Intervention, Breast Self Examination (BSE).

**Introduction:**
According to National Cancer Registries and Regional Cancer Centers, Breast Cancer is the commonest cancer amongst women in Ahmedabad, Delhi, Kolkata, Mumbai and Trivandrum. It accounts for 19-34% of all cancer cases among women in India[1]. Moreover, data for national and regional cancer centers also show that there is an increase in the incidence of breast cancer. There is no definite primary prevention as yet. Therefore, early detection and prompt and adequate treatment (i.e. secondary prevention) of breast cancer would be helpful to decrease mortality from this disease. In developing countries, early detection by Breast Self Examination (BSE) is considered to be a simple, inexpensive, non-invasive, and non-hazardous intervention, which is not only acceptable, cost-effective and appropriate method of early detection of cancer, but also encourages women to take an active responsibility in preventive health. BSE is the most important individual preventive health strategy to be practiced by women on a regular basis. However, correct and thorough BSE has to be ensured and prompt and adequate medical help should be available when needed. Though BSE is recommended for all women after the age of 20, it is an important option for younger women.

**Aims and Objectives:**
To assess the baseline knowledge of Breast cancer and its various aspects in the women subjects studied,
To impart knowledge of importance of Breast cancer, its various causes, risk factors and signs & symptoms.
To impart knowledge of available screening methods of Breast cancer viz. Breast Self Examination, Clinical Examination by health professional and Mammography to these women, to teach these women how to do BSE and practice BSE regularly every month.
To evaluate the Health Education (HE) Intervention amongst these women after imparting education on the above aspects of breast cancer, to evaluate the practice of BSE, 3 months after intervention amongst these women.

**Methodology:**
This study was conducted in the UHCs of Ahmedabad Municipal Corporation on 250 women beneficiaries over 20 years of age, (20 to 70+ years) attending two Urban Health Centers of West Zone of Ahmedabad during six months, from March to August 2010. Baseline knowledge (Pre-test) was assessed using a predesigned, pre-tested questionnaire on various aspects of breast cancer. They were also taught how to do prevent it by early detection of the disease using BSE method step by step. Health Education Intervention on various aspects of breast cancer including screening methods and demonstration was done using video slides on LCD & Flip-Charts[2] for these women in small

groups of 20-25 subjects in each session on a mutually convenient day in the afternoon session in the UHCs. Total thirteen sessions were held in these UHCs to cover all these subjects. These HE Intervention sessions were attended by some more women (who did not participate in the study) and health staff of the UHCs as well. Photo-copies of BSE methodology was distributed to all the subjects for facilitating BSE at home on a regular basis. Women were asked to attend the next session on a fixed day if they had any query on the procedure of BSE. Post-Test was also taken using the same questionnaire, three months after the HE intervention. There was cent percent response rate of all the subjects included in the study. Mean, SD and Proportions. Chi square test was used in bivariate analysis.

**Observations:**

Mean age of the women was 33.7 ± 10.4 years and median age was 37.5 years. Ever married women were 227 (90.8%). While housewives constituted 131 (52.4%) and students 4 (1.6%), the rest were gainfully employed. Over 50% were educated upto graduation or more, but 20 (8%) were illiterate and the rest had done some schooling. (Table-1

**Table 1 Socio-demographic and reproductive behavior information of the women under the study**

| Sr. No. | Reproductive behavior information | Mean ± S.D. |
|---|---|---|
| 1 | Average age of the women (Years) | 33.66 ± 10.41 |
| 2 | Average age of Menarche (Years) | 14.05 ± 1.61 |
| 3 | Average no. of children | 1.75 ± 1.03 |
| 4 | Average age of first birth (Years) | 22.4 ± 5.99 |
| 5 | Average duration of Breast Feeding (Months) | 16.02 ± 12.32 |
| 6 | Average age of Menopause (Years) | 44.75 ± 5.47 |

Awareness about breast cancer as a disease entity was observed in 128 (51.2%) women. Main sources of knowledge were Health professionals (34.4%), magazines (32.8%), and media (14%). Baseline (Pre-test) knowledge regarding risk factors of breast cancer was ranging between 21% to 49%. Three months after HE intervention and demonstration, knowledge had increased. The difference between pre and post test was in the range of 36.8% to 68.4%. This is given in Table-2

**Table 2: Comparison of Knowledge about Risk Factors of Breast Cancer before & after HE intervention (Pre & Post Intervention scores)**

| Sr. No. | Questions related to Risk Factors of Breast Cancer | Pre-Test Score (%) | Post-Test Score (%) | Differ-ence | p-value |
|---|---|---|---|---|---|
| 1 | Increasing age | 42 | 88 | 46 | 0.000 |
| 2 | Nulliparity | 25.2 | 89.2 | 64 | 0.005 |
| 3 | Lack of breast feeding | 49.6 | 86.4 | 36.8 | 0.000 |
| 4 | Family history of Br. Cancer | 27.6 | 89.6 | 62 | 0.000 |
| 5 | Age at first pregnancy >30 years | 29.6 | 88.8 | 59.2 | 0.000 |
| 6 | Age at menopause >50 years | 21.2 | 89.6 | 68.4 | 0.000 |
| 7 | Obesity | 26 | 91.2 | 65.2 | 0.000 |
| 8 | Oral Contraceptive Pills | 27.6 | 86.4 | 58.8 | 0.000 |
| 9 | Cancer probability in other breast | 35.6 | 91.6 | 56 | 0.000 |

Reported Contraceptive prevalence was only 29.5% (67 out of 227 married women). The common methods practiced by the users were viz. Condom (30%), Copper-T (25.4%), Oral Pills (28.4%) and female sterilization (12%).

Knowledge regarding various screening methods for the breast cancer had increased by 64% and 74.4% for BSE and Mammography respectively after the Health Education intervention. (Table-III). In our study, compliance to BSE, (performing BSE at least once) 3 months after the intervention was observed in 49 (19.6%) subjects, whereas only 6 (2.4%) performed three times.

**Table 3: Comparison of Knowledge about Screening methods of Breast Cancer before & after HE intervention**

| Sr. No | Other Factors of Breast Cancer | Pre-Test Score (%) | Post-Test Score (%) | Difference (%) | p-value |
|---|---|---|---|---|---|
| 1 | Knowledge about BSE | 26.8 | 90.8 | 64 | 0.000 |
| 2 | Knowledge about Mammography | 14.8 | 89.2 | 74.4 | 0.005 |

**Discussion:**

In a study by P Somdatta and N Baridalyne on "Awareness of breast cancer in women of an urban resettlement colony", 56% women were aware of breast cancer and 53% were aware that breast cancer can be detected early, but only 35% mentioned about risk factors.[3] Breast feeding as protective factor was known to 24% of respondents. Oral Contraceptives were recognized as risk factor by 8% and advancing age by 4.9% women. The source of information was television (42%), Neighbours (41%), hospital staff (19%), print media (9%) and radio (3%)[3].

Sonia Puri, et al, studied "Awareness of Risk Factors and Aspects of Breast Cancer among North Indian Women".[4] The two main risk factors of breast cancer in their study were late initiation of breast feeding (15.3%) or not practicing breast feeding (16.9%). Late marriage being a risk factor was known only to 5.9% respondents and relation of obesity with breast cancer was known to only 9.1% subjects. The main preventive modality, breast self exam was known by only 33% subjects[4].

KhadigaF. Dandash, and Abdurrahman Al-Mohaimeed [5] studied female teachers of Saudi Arabia and reported several risk factors, viz. lack of breast feeding (52.7%), female sex hormones (38.6%), positive family history of breast cancer (22.1%), nulliparity (4.8%) and increasing age (2.7%). The main sources of knowledge in this group was print media (83.2%), television (68.2%), family and friends (28.6%) and health professionals (14.1%). BSE as a screening method was recognized by 43.4% and mammography by (9.3%), but it was done during the last month by only 15.4% women[5].

In the study of Salaudeen, Akanda and Musa[6], 36.7 percent of the respondents had good scores on knowledge of the cause of breast cancer and 81.9% respondents had heard of breast self examination. When asked about source of information about BSE, 23.6% respondents mentioned television, 15.0% mentioned print media and 18.6% identified health workers. Radio was mentioned by 18.2% and 6.5% identified friends as source of information on BSE[6].

In our study, compliance to BSE, at least once after the intervention was nearly 20%, as compared to the rate of ever doing BSE in Malaysian women workers in electronic factories was 44.8%.; but BSE at least once a month was only 24.4% workers[7]. The rates reported for National Health & Morbidity Survey in Malaysian women over 20 years of age was 34.2% and in urban women was 36.3%[7].

Conclusions and Recommendations:

Even though Pre-test knowledge levels regarding various factors associated with breast cancer was ranging from 21% to 49%, Post-test carried out minimum three months after the HE Intervention study showed a very encouraging and appreciable difference (range 36.8% to 68.4%), which was significant. (p value=0.000).

Thus, it was observed that awareness about breast cancer is low amongst women in this community. Therefore, public education on cancers of women should be conducted on a regular basis in the health centers and clinics. Propagation of correct messages for early detection of breast cancer and regular practice of BSE has to be promoted amongst all sections of women. Clinical breast examination should be carried out at UHC by health professionals when needed.

Cancer Society recommended that the monthly practice of BSE begin at the age of 20 in order for women to develop BSE as a monthly habit, and to encourage women to take responsibility for their own health[8].

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**"It is more important to know what sort of person has a disease than to know what sort of disease a person has."**

***-Hippocrates (460-377 B.C.)***

**"The greatest discovery of any generation is that human beings can alter their lives by altering the attitudes of their minds."**

***-Albert Schweitzer***

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**Original article**

# A cross sectional study of the knowledge, attitude and practice of ASHA workers regarding child health (under five years of age) in Surendranagar district

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**Abstract:**
Background: Activity of ASHA (Accredited Social Health Activist) is one of the key components in the National Rural Health Mission. They can play an important role in identifying child morbidity at the earliest and improving their health status.
**Aims and objectives:** 1. To find out the knowledge, attitude and practice of ASHA workers regarding child health under five years of age. 2. To associate their knowledge, attitude and practice with education level of ASHA workers. 3. To associate their knowledge, attitude and practice with total duration of services as ASHA worker.
**Materials and Methods:** Type of the study: Cross sectional study, Study area/setting: Five PHC of Surendranagar district, Participants & sample size: 130 "ASHA" Workers, sampling: Simple random sampling . Data collection: Pre-designed and pre-tested proforma
**Results:** The mean age of subjects was 27.8 ±6. About 70% of them had received secondary level of education. Almost 86.2% of ASHA workers had improper knowledge regarding new born care. Nearly 70% knew the causes of diarrhea but 91.5% of them had no idea about signs of the dehydration. About 68.46% and 68.47% had lack of knowledge about measles & pneumonia respectively. Approximately 80.77% knew about signs/symptoms of malaria but 59.23% among them did not know what to do if the child was having it.
**Conclusion:** Inspite of training which is given to ASHA workers there is still a lacunae left in their knowledge regarding the various aspects of morbidity and mortality of children under 5 years of age. So frequency and quality of training of ASHA workers must be strengthened.
**Keywords:** KAP, ASHA, child (under five years of age), child health, duration of service, education.

**Introduction**
Around 9.2 million children die every year before reaching their fifth birthday. Most of these deaths occur in developing countries in which leading causes are: acute lower respiratory infections, (mostly pneumonia:19% of all deaths in under fives), diarrhea (17%), malaria (8%), measles (4%), HIV/AIDS (3%), neonatal deaths – mainly preterm births, birth asphyxia, infections (37%) and injuries (3%). Poor or delayed "health care seeking" contributes to 70% of child deaths. Most deaths among under five are still attributable to just a handful of conditions and are avoidable through existing interventions[1]
Activity of ASHA [Accredited Social Health Activist] is one of the key components in the National rural Health Mission. They provide information to the community on determinants of health such as nutrition, basic sanitation, hygienic practices, healthy living & working condition, information on existing health services and need for the timely utilization of health and family welfare services[2,] and they are an important link between the community and health facilities[4.] They can play an important role in identifying child morbidity at the earliest and help in improving their health status. Therefore it is important to assess the level of knowledge regarding health and health aspects in this workers[2.]
**Aims and objectives:**
1.To find out the knowledge, attitude and practice of ASHA workers regarding child health Under five years age.
2.To associate their knowledge, attitude and practice with education level of ASHA Workers.
3.To associate their knowledge, attitude and practice with total duration of services as ASHA worker.
**Methodology:**
A Cross-sectional study was carried out amongst ASHA workers of Surendranagar district. Five PHCs were selected by simple random sampling. Totally 130 ASHAs were present during their monthly meeting at their

respective PHCs. Data was collected regarding their knowledge, attitude and Practice about topics like breastfeeding, complimentary Feeding, immunization, diarrhea, essential new born care, measles, malaria, respiratory infection, worm infestation, personal hygiene etc. All information was obtained using by a pre-tested questionnaire, after taking prior consent of workers and relevant health authority

Data analysis: The obtained data was analyzed by using SPSS 17.0 [Statistical Package for Social Sciences] $X^2$ test has been used to associate various findings and variables.

**Results:**

The mean age of subjects 27.8±6., about 70% had received Secondary level of education. Nearly 90% ASHA workers are married and around 95% of ASHA workers were from Social Class IV (upper lower), as per the kuppuswami classification[1]

**Table 1: Profile of ASHA workers**

| Sr. No. | Socio - Demography (n=130) | Number | % |
|---|---|---|---|
| | **AGE GROUP** | | |
| 1 | 15-24 | 45 | 34.6 |
| 2 | 25-34 | 69 | 53.1 |
| 3 | 35-44 | 15 | 11.5 |
| 4 | 45-54 | 1 | 0.8 |
| | **MARITAL STATUS** | | |
| 1 | Unmarried | 12 | 9.2 |
| 2 | Married | 116 | 89.2 |
| 3 | Widow | 2 | 1.5 |
| | **SOCIAL CLASS** | | |
| 1 | Class-III (lower middle) | 7 | 5.38 |
| 2 | Class-IV (upper lower) | 123 | 94.62 |

As per the ASHA workers , Almost 90.76% under five years age mortality was due to infectious diseases and around 83% and 55% was due to diarrheal diseases and respiratory tract infection respectively.

Figure 1: Knowledge, Attitude And Practice Of ASHA Workers Regarding Newborn Care

**Table 2: Most common causes of child mortality(under five yrs age) according to ASHA workers. ( Multiple Response Table )**

| Sr. No. | MOST COMMON CAUSES | NUMBER | (%)age |
|---|---|---|---|
| 1 | **Diarrheal diseases** | **108** | **83.07** |
| 2 | **Respiratory tract infection** | **72** | **55.38** |
| 3 | **Malnutrition** | **22** | **16.92** |
| 4 | **Infectious diseases (measles,whooping cough etc)** | **118** | **90.76** |
| 5 | **Other febrile diseases** | **24** | **18.46** |
| 6 | **Accidents & injuries** | **8** | **6.15** |

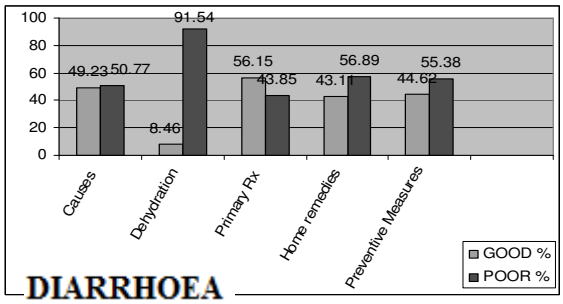
Around 90% had improper knowledge regarding hypothermia and kangaroo mother care. Nearly 80% had poor knowledge regarding neonatal infection. 86.16% of ASHA workers had poor knowledge regarding referral condition and when and where to refer the baby.

**TABLE 3 : Knowledge , attitude and practice of ASHA workers regarding breast feeding & complimentary feeding.**

| S.No | DETAILS OF BREAST FEEDING & COMPLIMENTARY FEEDING | KNOWLEDGE,ATTITUDE & PRACTICE (n=130) | | | |
|---|---|---|---|---|---|
| | | GOOD | | POOR | |
| | | NO. | % | NO. | % |
| 1 | Prelacteal Feed | 126 | 96.92 | 4 | 3.08 |
| 2 | Immediate Breast Feeding | 107 | 82.31 | 23 | 17.69 |
| 3 | Interval Of Breast Feeding | 38 | 29.23 | 92 | 70.77 |
| 4 | Position, Attachment | 56 | 43.07 | 74 | 56.93 |
| 5 | Problems Regarding Breast Feeding | 17 | 13.08 | 113 | 86.92 |
| 6 | Complimentary Feeding | 37 | 28.46 | 93 | 71.54 |

Amongst ASHA workers, 96.92% had good knowledge, attitude and practice regarding prelacteal feed and 82.31% knew the importance of immediate breast feeding, within half an hour of normal delivery. But around 70% had poor knowledge regarding interval of breast feeding as to how many times the child should be breastfed, in daytime and night. Nearly 86% and 71% had poor knowledge of problems regarding breast feeding and complimentary feeding respectively.

**Figure 2 : Knowledge, attitude and practice of ASHA workers regarding diarrhea and measles**




Nearly 50% knew the causes of diarrhea but 91.54% and 55.38% had poor knowledge regarding signs of dehydration and preventive measures respectively. Only 8.46% knew causes of measles and around 88.47% had poor knowledge for preventive measures in measles.

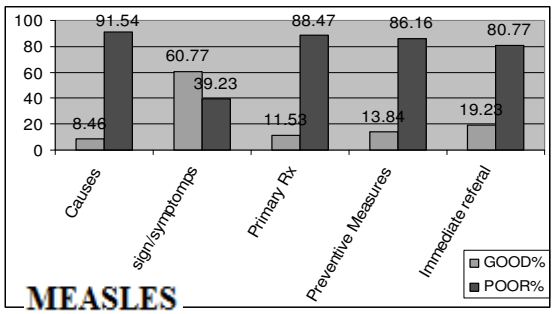
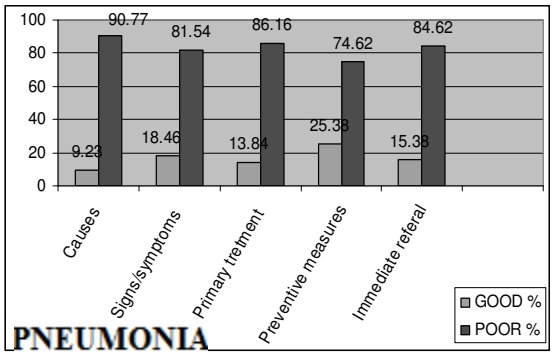
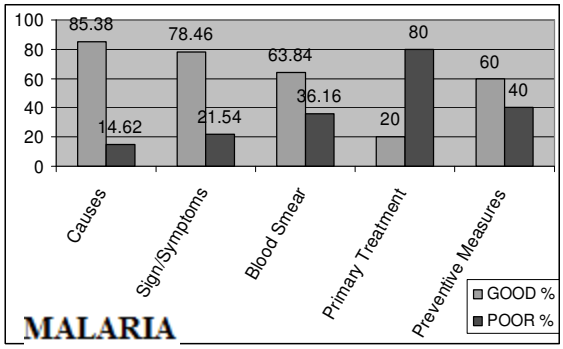



**Figure 3: Knowledge, attitude and practice of ASHA workers: pneumonia & malaria**




Respectively 90.77% and 86.16% had no idea regarding causes & primary treatment in pneumonia. For malaria they had better knowledge regarding causes, primary treatment, blood smear and preventive measures.

**Table 4: : Knowledge, attitude and practice, and education level of ASHA workers.**

| Sr. No. | EDUCATION | KNOWLEDGE, ATTITUDE & PRACTICE | | | | | |
|---|---|---|---|---|---|---|---|
| | | GOOD | | POOR | | TOTAL n=130 | |
| | | NO. | % | NO. | % | NO. | % |
| 1 | Primary | 9 | 33.33 | 18 | 66.67 | 27 | 20.76 |
| 2 | Secondary | 40 | 48.19 | 43 | 51.81 | 83 | 63.84 |
| 3 | Higher Secondary | 6 | 54.54 | 5 | 45.46 | 11 | 8.46 |
| 4 | Graduate | 6 | 66.66 | 3 | 33.34 | 9 | 6.92 |

The association was not statistically significant. ($X^2$= 3.721 , DF=3,P=0.2932 )

As the table shows, there was no any association between increase in educational level of ASHA workers on increase in knowledge, attitude and practice regarding child health .

**Table 5 : Knowledge , attitude and practice, and duration of total services**

| Sr. No. | DURATION OF TOTAL SERVICES IN (MONTHS) | KNOWLEDGE, ATTITUDE & PRACTICE | | | | | |
|---|---|---|---|---|---|---|---|
| | | GOOD | | POOR | | TOTAL n=130 | |
| | | NO. | % | NO. | % | NO. | % |
| 1 | <6 Months | 5 | 20.83 | 19 | 79.17 | 24 | 18.46 |
| 2 | 7-12 Mths | 9 | 40.9 | 13 | 59.1 | 22 | 16.92 |
| 3 | 13-24 Mths | 30 | 63.82 | 17 | 36.18 | 47 | 36.15 |
| 4 | >24 Months | 28 | 75.67 | 9 | 24.33 | 37 | 28.46 |

The association proved to be statistically highly significant ( $X^2$ = 20.982 , DF=3,P=0.0001)

As the duration of total services increased, knowledge, attitude and practices also improved. Around 63.82% of those ASHA workers having duration more than 13-24 months had good knowledge, attitude, practice regarding child health.

**Discussion:**

**Table 6 : Knowledge, attitude and practice of ASHA workers regarding child health**

| Sr. No | DETAILS OF CHILD HEALTH | KNOWLEDGE, ATTITUDE & PRACTICE ( n=130 ) | | | |
|---|---|---|---|---|---|
| | | GOOD | | POOR | |
| | | NO. | % | NO. | % |
| 1 | Newborn Care | 18 | 13.84 | 112 | 86.16 |
| 2 | Breast Feeding & Complimentary Feeding | 38 | 29.23 | 92 | 70.77 |
| 3 | Immunization | 48 | 36.92 | 82 | 63.08 |
| 4 | Diarrhoea | 64 | 49.23 | 37 | 50.77 |
| 5 | Measles | 21 | 16.15 | 109 | 83.85 |
| 6 | Pneumonia | 11 | 8.46 | 119 | 91.54 |
| 7 | Malaria | 53 | 40.77 | 77 | 59.23 |
| 8 | Worm Infestation | 91 | 70.00 | 39 | 30.00 |
| 9 | Hygiene | 72 | 55.38 | 58 | 44.62 |
| 10 | Immediate Referal | 23 | 17.69 | 107 | 82.31 |

Almost all the ASHAs belonged to local community and acted as effective link persons in the delivery of health services and in providing health awareness. In the present study, as per the age distribution of ASHA workers, majority of them were between 25-34 (53.1%) years of age , which is nearly same (54%) as in another study of interface of ASHA with the community and service providers in eastern Uttar Pradesh by Deoki Nandan et al[3.] In the same study, 90% of the ASHAs were having a qualification between 8th and 12th class[3] and in this study it was around 70% which is Sufficient enough for their proper learning and performance. Around 89.2% ASHA workers were married while 9.2% and 1.5% were unmarried and widows respectively. Almost 86.2% of ASHA workers had improper knowledge regarding newborn care and 90% ASHA workers were not knowing as what advice to give to mother for prevention of hypothermia and how to give kangaroo mother care. 86% were doing improper practice as they had poor knowledge regarding immediate referral condition. Around 70% had poor knowledge about breast feeding and complimentary feeding. As nearly 97% knew about prelacteal feed not to be given but 71% had poor knowledge regarding intervals of breast feeding in a day. Nearly 63% knew which are the vaccine preventable diseases but 70% ASHA workers had poor knowledge regarding schedule of immunization as they had less knowledge asto when to take child for vaccination and for which vaccine. As compared to other diseases, their knowledge and practices were found to be better for diarrhea, as nearly 75% knew when to give ORS and advice for immediate referral. Around 68.46% and 91.54% had lack of knowledge and improper practicing for measles & pneumonia respectively. For malaria, their practice was good as 85% knew the causes and symptoms of malaria. Nearly 64% of them were knowing how and when to take blood smear. In this study major motivating factor for ASHAs were either money or absorption in government job as also shown in the study done by Deoki Nandan et al[3.] About one third of ASHAs were earning more then Rs 800 per month where as another one third were earning less than Rs 400 per month, nearly same as shown in another study.[3]

**Conclusions & recommendations:**

Inspite of the training given to ASHA workers, there is still lacunae left in their knowledge regarding the various aspects of "under five years age morbidity and mortality". Training of ASHAs seems to be neither as per norms nor regular. Training is the backbone of capacity building and functioning of ASHAs. So it must be done timely, properly and effectively. It has to be ensured during training that ASHAs are well aware about there job responsibilities and are capable to fulfil their job responsibilities. So frequency and quality of training for ASHA workers must be strengthened. An improvement in financial provision of atleast Rs. One thousand per month as salary has been recommended by most of the medical officers of PHCs as a strong motivating factor.

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## Original article

# A Bayesian approach to compare the statewise malaria death counts in India

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**Abstract**

**Context:** In India malaria is a major public health problem as 95 percent of the population is exposed to the danger of being infected. Estimating the true disease burden of malaria in the country is a challenge, as true burden cannot be understood from ordinary count data on the number of deaths or number of infected cases.

**Objective:** The goal of this study is to compare the Indian states by the true burden due to malaria (*Plasmodium falciparum*) in the year 2010 and rank the states with respect to their performance to deal with malarial death.

**Study Design:** To deal with count data problems as a representation of death, the Bayesian approach is used. The source of data is the National Malaria Control Report published by NVBDCP of 2009 and 2010 till the month of August. The statewise comparison of death due to malaria has been performed with all computation done using statistical software R.

Main Outcome: Certain states like Orissa, Chhattisgarh, Karnataka, Meghalaya, Jharkhand and Assam had very high incidence of *Plasmodium falciparum* infection. But the mortality per unit exposure due to malarial infection is least in Chhattisgarh.

**Results and Conclusion**: This statewise malaria death comparison can be helpful to authorize the state specific malaria control programme, as several issues which are not clear from count data.

**Key Words:** Plasmodium falciparum, Bayesian estimation, Shrikage Estimator, Public health.

## Introduction

Malaria is endemic in tropical and subtropical regions and is therefore a disease of hot and humid climates[1] and is caused by *Plasmodium falciparum* infection[2]. Annual malaria morbidity alone is 300-500 million people and has a conservative mortality estimate of 700,000-2.7 million lives[3]. In sub-Saharan Africa, where 90 percent of the world's malaria occurs, about 500 million cases are recorded annually with hundreds of thousands of child deaths[4].

India is one of the remaining nine countries outside sub-Saharan Africa where the incidence of malaria is high. In the country, malaria is a major public health problem as 95% population is exposed with the infection[5]. A steady decline has been observed in malaria infected patients since 1976 to 1996 from 6.47 million cases to 2.5 million cases in India. The number of deaths reported from the country was 1006 and 935 respectively in 2003 and 2008 but in 2006 the number of deaths suddenly increased to 17073. Thirteen National Vector- borne Disease Control Programme (NVBDCP) teams routinely monitor *Plasmodium falciparum* drug sensitivity in the country. These teams are located in various regions so as to cover the entire country. *Plasmodium falciparum* monitoring for drug sensitivity is done using the World Health Organization (WHO) methodology of in vivo (28-day) test procedure for determining the status of resistance to CQ and other anti-malarial drugs in *Plasmodium falciparum*. In 2007, Indian National Vector Borne Disease Control Programme (NVB-DCP) reported cases were 1,502,742 and 1,274 deaths.

The success in the eradication of malaria is much lower in countries where economy grows at a much-reduced rate compared to those without much incidence of malaria[3]. In different independent studies conducted by the Indian Council of Medical Research at different time periods it was proved that malaria incidence and death cases have been hugely under-estimated [6–9]. Estimating the true disease burden of malaria in the country is a challenge task considering its varied epidemiology and dynamics of transmission. The topographical difference, hot and humid living conditions at places, difference in the share of average annual rainfall, disparity in the share of resources, unplanned urbanization and several other factors may be held responsible for the unsuccessful attempts in the uprooting diseases like malaria from the country. It is necessary that the issues of public health be studied at the different regional level, going down to each individual states and if possible to the level of districts, at which the implementation of several government policies including those related to public health initiates. However, to understand

the extent and pace to which the different public health policies are implemented at the different states it is necessary to estimate the actual burden of the corresponding health problem, with malaria being no exception.

Considering the severity of malaria in the country and the need of estimating the true burden of malaria at the different states of the country provides the backdrop of such a study. The study is set to understand the disease burden of malaria to which the different states are subjected, based on the national malaria control reports published by NVBDCP up to August 2010.

There are endless studies that are concentrated on issues related to the concerned topic. Bose[10] highlighted the issues of high incidence of malaria cases in the desert state of Rajasthan, especially after the monsoons despite the impressive control programs. Amrith[2] express how the political intervention in different public health related issues, including malaria, make the states initiative narrowly targeted. Deb Roy[11] discusses the ambiguity of practicing physicians approach to the treatment of malaria following development of several conflicting theories relating to understanding the disease especially after the malarial epidemic in the third quarter of the previous century. Das Gupta[12] raised issues of sever neglect in the status of public health in the country and holds such negligence responsible for spread of diseases like malaria. Mahajan and others[13] tried to estimate the underlying preferences and use the model to study the adoption of bednets among poor households in rural Orissa from number of reported cases of malaria occurrence based on NVBDCP, 2008 data. Singh and others[14] expressed the effectiveness of rapid malaria diagnostic test over traditional tests in India. However, our search did not enrich any study related to the estimation of true burden of the disease at the different states of the country. The true burden of malaria cannot be understood from the death count data due to reasons explained in the later part of the work.

The primary goal of this study is to compare the states by their number of death reported due to malaria (*Plasmodium falciparum*) in the year 2010. To evaluate the death rate of the states, we use the death report published by NVBDCP, in 2009. It is true that death count in many states due to malaria come down near zero, yet still there are some states where the death count is very high. To increase the strength of estimation, we prefer to use hierarchical Bayesian approach with the help of prior information by the size of mortality. The hierarchical Bayesian models are used when it is believed that the observations are statistically dependent. This generally happens when subjects drawn from the same cluster are more similar to each other compared to subjects from different clusters. For further reading on hierarchical Bayesian approach readers are requested to refer to Lynch[15] or Gill[16].

Using Bayesian approach in identifying risk factor of diseases in a confined population is frequently encountered in several health related studies. Some pioneering works in this regard includes Diggle, Elliott, Morris and Shaddick[17]; Elliott[18]; Volinsky, Magigan, Raftery and Kronmal[19]; Wakefield and Morris[20] etc.

**Material and Methods**

The data required for the study is based on the National Malaria Control Report published by NVBDCP of 2009 and 2010 till the month of August. The report provides statewise total blood slides examinations, malaria cases, *Plasmodium falcifarum* cases and death in each year. The reports used to publish in each year based on information of the previous years. The statewise comparison of death due to malaria has been performed by comparing the mortality rate per unit exposure rate. The estimate of which for each of the states is obtained through a Bayesian analysis. It is practical to assume the true rates are similar in size that generates the dependency between the parameter. The presence of one states true mortality rate can influence the image of other states true mortality rate. To deal with such problem it is good practice to call a hyper-parameter to reduce the dependency between parameters. The whole process produces the system of a hierarchical prior guiding us to use hierarchical Bayesian approach. All the relevant calculations are performed in the statistical software R(The Software can be freely downloaded from http://cran.r-project.org)

The total number of exposed person due to malaria has been denoted by e. The estimate of mortality rate per unit of exposure rate assumed by $\lambda$. It has been assumed that the death count Y follow Poisson distribution with mean $e\lambda$. The standard estimate of $\lambda$ is, $\hat{\lambda} = y / e$.

The comparison due to death rate among the states in 2010, has been performed by the prior information of mortality rate generated by reports of 2009 death counts. In the annual state report many state's death count is zero or nearer

to zero and many states are having higher number of death counts. The prior information about death has been obtained from 10 randomly selected states as a representative of malaria endemic and epidemic area.

Here, $Z_i$ represents the number of deaths in the $i^{th}$ state and $O_i$ represents the number of people exposure due to *Plasmodium falciparum* in the year 2009. It is assumed that $Z_i$ will follow Poisson distribution of mean $\lambda$. Initially $\lambda$ assigns as a standard non-informative prior by, $P(\lambda) = \lambda^{-1}$ and the distribution for $\lambda$, given the form of 35 states becomes $P(\lambda) \propto \lambda^{-1} exp(-\beta\lambda)$, $\lambda > 0$. The gamma ($\alpha$, $\beta$) prior for $\lambda$ has been use by $\alpha = \sum_{i=1}^{35} Z_i$ and $\beta = \sum_{i=1}^{35} O_i$

In 2009 data, $\sum_{i=1}^{35} Z_i$ = 336 and $\beta = \sum_{i=1}^{35} O_i$ = 346272. We assign, gamma prior for $\lambda$ with parameters (336, 346272).

The observed number of deaths due to the *Plasmodium falciparum* is denoted by $y$ and it is supposed that for the particular state with exposure of $e$ the distribution will be Poisson($e\lambda$).

In the prior model $\lambda$ assigned with gamma ($\alpha$, $\beta$) and the posterior distribution becomes in the form of gamma($\alpha + y$, $\beta + e$) The predictive density of $y$ is,

$$f(y) = \frac{f(y \mid \lambda) g(\lambda)}{g(\lambda \mid y)} \quad \ldots(1)$$

for $f(y|\lambda) \sim$ Poi(e$\lambda$). In the sampling $g(\lambda)$, $g(\lambda|y)$ is the prior and posterior density of $\lambda$.

In the first step, the death rate $\lambda_i$ assumed to be generate from gamma( $\alpha$, $\alpha/\mu$) distribution with the mean $\mu$ and $\mu^2/\alpha$.

$$G(\lambda \mid \alpha, \mu) = \frac{(\alpha/\mu)^{\alpha} \lambda^{\alpha-1} \exp(-\alpha\lambda/\mu)}{\Gamma(\alpha)}, \quad \alpha, \lambda > 0 \quad \ldots(2)$$

In the second step, $\mu$ and $\alpha$ are assumed to be independent and $\mu$ is in gamma prior by gamma($a,b$) and $\alpha$ has a density function of

$$g(\alpha) = \frac{V}{(\alpha + v_0)^2}, \alpha > 0.$$

V is the median value of $\alpha$. As $\alpha$ tends to infinity rate $\lambda_i$'s will concentrated in the same line by $\lambda_1 = \lambda_2 = \cdots = \lambda_{35}$

The posterior distribution of $\lambda_i$ is gamma ($y_i + \alpha$, $e_i + \alpha/\mu$). The posterior mean of $\lambda_i$ can be express by

$$E(\lambda_i \mid y, \alpha, \mu) = \frac{y_i + \alpha}{e_i + \alpha/\mu} \quad \ldots(3)$$

The shrinkage estimator $B_i$ can be useful in place of $\lambda_i$ to know the true posterior mean.

The shrinkage estimator can be replaced in equation (1) by,

$$E(\lambda_i \mid y, \alpha, \mu) = \frac{y_i + \alpha}{e_i + \alpha/\mu} = (1 - B_i)\frac{y_i}{e_i} + B_i\mu \quad \ldots(4)$$

where $B_i = \frac{\alpha}{\alpha + e_i}$. This estimator is useful to improving the estimation by reducing the mean squared error towards zero. Shrinkage is implicit in Bayesian inference.

The number of deaths in one year for *Plasmodium falcifarum* has been reported for each of the 35 states. Let $y_i$ and $e_i$ is the number of deaths and exposure for the $i^{th}$ state. We assumed that the number of deaths $y_i$ follows a Poisson distribution with mean $e_i\lambda_i$ and the objective is to estimate the mortality rate per unit exposure $e_i\lambda_i$. The fraction $y_i/e_i$ is the number of deaths per unit exposure and can be viewed as an estimate of the death rate for the $i^{th}$ state. We plot the ratios $y_i/e_i$ against the logarithms of the exposures $log(e_i)$ for all states where each point is labeled by the number of observed deaths $y_i$. The estimated rates are highly variable, especially for programs with small exposures. The states experiencing no deaths (a plotting label of 0) also are primarily associated with small exposures. Suppose we are interested in simultaneously estimating the true mortality rates $\lambda_i$ for all states. One option is to simply estimate the true rates by the individual death rates $y_1/e_1, \cdots, y_{35}/e_{35}$.

Unfortunately, these individual rates can be poor estimates, especially for the states with small exposures. We saw that some of these states did not experience any deaths and the individual death rate $y_i/e_i = 0$ would likely underestimate the states' true risk of mortality. Also it is found that the rates for the states with small exposures have high variability.

Since the individual death rates are not reliable estimates of the actual situation, so it seems desirable to combine the individual estimates in some way to obtain improved estimates.

Suppose we assume that the true mortality rates are equal across states; that is, $\lambda_1 = \cdots = \lambda_{35}$. Under this "equal-means" Poisson model, the estimate of the mortality rate for the $i^{th}$ state would be the pooled estimate $\sum_{i=1}^{35} y_i / \sum_{i=1}^{35} e_i$. But this pooled estimate is based on the strong assumption that the true mortality rate is the same across states. This is questionable since one would expect some variation in the true rates. We have discussed two possible estimates for the mortality rate of the $i^{th}$ states: the individual estimate $y_i/e_i$ and the pooled estimate $\sum_{i=1}^{35} y_i / \sum_{i=1}^{35} e_i$.

A third likelihood is the cooperate estimate,

$$(1-\gamma)\frac{y_i}{e_i} + \gamma \frac{\sum_{i=1}^{35} y_i}{\sum_{i=1}^{35} e_i} \quad \ldots(5)$$

This estimate shrinks or moves the individual estimate $y_i/e_i$ toward the pooled estimate $\sum_{i=1}^{35} y_i / \sum_{i=1}^{35} e_i$, where the parameter $0 < \gamma < 1$ determines the size of the shrinkage. We use the posterior mean $B_i$ as a representation of the $i^{th}$ state shrinkage.

**Results**

We find the best states by using the smallest estimated mortality of states. The posterior mean of the mortality has been computed from the expectation of equation (1). We observed that Chhattisgarh as the one with smallest followed by Madhya Pradesh and Arunachal Pradesh. Kerala is the state with the highest true mortality status followed by Manipur and Maharashtra. To compare the best state "Chattisgarh" with the remaining states, we displayed the statewise rank in Table 1. Table 1 gives the probability P( $\lambda_{beststate} < \lambda_i$) for all $i$, where $\lambda_{beststate}$ represents the rate for "Chattisgarh" in this exercise. We have shown the probabilities for all the 35 states in column 4 of Table 1. The state "Chattisgarh" is better than most of these states as it's posterior probability is close to zero.

**Table1. Malaria Status with respect to best state**

| State | PF cases | Death | P($\lambda_{beststate} < \lambda_i$) $\times 10^6$ | Rank |
|---|---|---|---|---|
| Andhra Pradesh | 12510 | 11 | 901.95 | 10 |
| Arunachal Pradesh | 2314 | 0 | 196.95 | 3 |
| Assam | 30817 | 28 | 918.65 | 11 |
| Bihar | 291 | 1 | 2834.32 | 29 |
| Chhattisgarh | 32522 | 2 | 80.73 | 1 |
| Goa | 162 | 1 | 3935.32 | 31 |
| Gujarat | 1340 | 1 | 943.61 | 12 |
| Haryana | 13 | 0 | 2089.35 | 18 |
| Himachal Pradesh | 0 | 0 | 2354.8 | 27 |
| Jammu and Kashmir | 11 | 0 | 2238.77 | 24 |
| Jharkhand | 28861 | 8 | 296.35 | 5 |
| Karnataka | 3368 | 1 | 432.85 | 6 |
| Kerala | 126 | 3 | 9989.18 | 35 |
| Madhya Pradesh | 4799 | 0 | 113.58 | 2 |
| Maharashtra | 9390 | 60 | 6291.26 | 33 |
| Manipur | 217 | 4 | 9737.24 | 34 |
| Meghalaya | 24175 | 52 | 2146.12 | 20 |
| Mizoram | 7363 | 12 | 1619.88 | 16 |
| Nagaland | 963 | 1 | 1285.25 | 13 |
| Orissa | 166459 | 120 | 724.93 | 9 |
| Punjab | 4 | 0 | 2132.16 | 19 |
| Rajasthan | 149 | 0 | 1348.29 | 14 |
| Sikkim | 8 | 0 | 2225.16 | 23 |
| TamilNadu | 248 | 1 | 3120.46 | 30 |
| Tripura | 12868 | 2 | 197.48 | 4 |
| Uttarakhand | 21 | 0 | 2053.21 | 17 |
| UttarPradesh | 59 | 0 | 1617.04 | 15 |
| WestBengal | 6076 | 28 | 4438.71 | 32 |
| A.N.Islands | 624 | 0 | 618.12 | 7 |
| Chandigarh | 0 | 0 | 2305.65 | 25 |
| DNHaveli | 503 | 0 | 710.90 | 8 |
| Daman andDiu | 10 | 0 | 2197.08 | 22 |
| Delhi | 1 | 0 | 233.65 | 26 |
| Lakshadweep | 0 | 0 | 2427.01 | 28 |
| Puducherry | 0 | 0 | 2196.74 | 21 |

**Discussion**

Poor economic condition and deplorable conditions of living of the people in the country is a hindrance in the control of Malaria in spite of several efforts from the government and NGOs. The statewise ranking based on malaria status can be computed in each year based on its status report presented by NVBDCP. This statewise malaria death comparison can be helpful in providing necessary guidelines for planning the course of action for the state specific malaria control programme.

In India, maximum malaria cases are recorded in Orissa (Table 1). Similarly, in the other states inhabited by ethnic tribes mainly in the forest ecosystems, meso- to hyper-endemic conditions of malaria exist with the preponderance of *Plasmodium falciparum* to the extent of 90% or

even more. During August 2009 to July, 2010 of resurgence of malaria, certain states in India like Orissa, Chhattisgarh, Karnataka, Meghalaya, Jharkhand and Assam are found to have high incidence of *Plasmodium falciparum* infection. At the same time period Kerala, Maharashtra, Manipur and Orissa performed worst due to high amount of malaria deaths. Among all the states Punjab, Sikkim and Jammu and Kashmir performed best recording zero number of death and lowest number of malaria cases. However, when the true burden of malaria is considered via the posterior expectation of $\lambda$ the ranking of the states showed several changes as evident from Table-1.

It is interesting to note that Kerela, with a high human development index, highest literacy rate, and even less number of *Plasmodium falciparum* malaria cases has a high mortality rate due to malaria and is worst compared to the other states. This may be attributed to some chance cause occurring in a particular year or may be due to some hidden reasons. But this definitely calls for serious concern in subsequent years.

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## Original article

# Assessment of nutritional and health status of the school students of 5th to 9th standard (11 to 15 years age group) of Surendranagar district, Gujarat state, India.

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**Abstract**

**Background**: School health has been acknowledged as important since the beginning of 20th century. Malnutrition is a cause of poor cognitive performance and physical growth in children[3] .This study was undertaken to find out nutritional and health status of school children of Surendranagar district.

**Method**: A cross sectional study conducted in both private and government schools selected by simple random sampling. Each class had an enrolment of 50 students and all the students were examined. Pre - tested questionnaire was used to collect information regarding age, height, weight and nutritional assessment for morbidities in a standardized way.

**Results**: Among 366 boys and 134 girls of the study population, Mean Body Mass Index ( BMI) for boys and girls were 16.55 ± 2.58 and 16.75 ± 5.44 respectively. BMI was more in the private school as compared to the government school and Mid Upper Arm Circumference (MUAC) was also more in the private as compared to Government school. About 59.2% of children showed morbidities of various types related to nutrition.

**Conclusion**: The study revealed 59.2% morbidity in the school children related to nutritional problems. . BMI and MUAC were also lower than their reference value for that particular age group. In spite of various National Health programs for betterment of health of children, it is discouraging to note that there is a wide health gap in the health status which needs further exploration.

**Keywords:** MUAC, BMI, Morbidities, Refractory errors.

**Introduction:**

Malnutrition denotes impairment of health arising either from deficiency or excess or imbalance of nutrients in the body[2] .Adolescents represent around 20% of the global world's population and around 84% of them are found in developing countries[3]. Inadequate nutrition in adolescence can put them at high risk of chronic diseases particularly if combined with other adverse lifestyle behaviors[4]. The objectives for the present study are to study the overall nutritional and health status of the students of 11 to 15 years age group studying in Surendranagar, to make comparison of the results of students from government and private schools, to determine a tool that will be easier and more appropriate for screening of adolescent malnutrition because assessment of nutritional status by middle upper arm circumference (MUAC) was easier, more convenient requiring less expertise than assessment with BMI[5]

**Materials and methods :**

Type of a study was a cross – sectional study. All schools were registered first and from the list one school from private and one school from government selected as a study school by simple random sampling method. School children of a government and a private school (5th to 9th standards) of Surendranagar as a study population. After taking prior permission from principal of the school, interview dates of study were fixed.

**Techniques and tools :**

All the students thus registered were subjected to measurement of height, weight, mid arm circumference and clinical examinations. School record was used for getting reasonable accuracy in age assessment. A pre-designed and pre-tested performa was used for data collection. Middle upper arm circumference was measured in centimeter with a non-stretched measuring tape with the right arm hanging relaxed. The measurement was taken midway between the tip of acromian and olecranon process. The tape was placed gently but firmly round the arm to avoid compression of soft tissue.

**Results :**

**Table – 1: BMI (Mean ± SD) of the study population according to the age group and its comparison with their reference values. (n=500).**

| Sr. No. | Age in years | Frequency (%) | BMI (MEAN ± SD) | Reference value | Difference of MEAN BMI | P value |
|---|---|---|---|---|---|---|
| 1. | 11 | 74 (14.8) | 15.64 ± 2.15 | 20.5 ± 6.78 | 4.86 | 0.0012 |
| 2. | 12 | 145 (29) | 16.30 ± 2.65 | 21.0 ± 7.29 | 4.7 | 0.0003 |
| 3. | 13 | 109 (21.8) | 16.85 ± 2.90 | 21.8 ± 6.74 | 4.15 | 0.0041 |
| 4. | 14 | 83 (16.6) | 16.58 ± 2.14 | 22.0 ± 8.22 | 5.42 | 0.0019 |
| 5. | 15 | 89 (17.8) | 17.63 ± 6.35 | 23.2 ± 5.91 | 5.57 | 0.0013 |
| Statistically significant p value <0.001 at 5 % Significance level. | | | | | | |

Table – 1 shows BMI results of the study population is comparatively lower for all the age groups with their reference value according to National Health and Nutritional Survey 2003-06 conducted by CDC, National Center for Health Statistics[4] suggestive of malnutrition for all the age group.

**Table – 2 : MUAC (MEAN ± SD) of the study population according to their age and its comparison with their reference value (n=500).**

| Sr. No | Age in years | Frequency (%) | MUAC (MEAN ± SD) | Reference value | Difference of Mean MUAC | P value |
|---|---|---|---|---|---|---|
| 1. | 11 | 74 (14.8) | 19.13 ± 4.58 | 24.6 ± 6.82 | 5.47 | 0.005 |
| 2. | 12 | 145 (29) | 20.96 ± 3.00 | 25.4 ± 6.91 | 4.44 | 0.0132 |
| 3. | 13 | 109 (21.8) | 21.67 ± 2.69 | 26.8 ± 6.38 | 5.13 | 0.0076 |
| 4. | 14 | 83 (16.6) | 21.48 ± 2.09 | 27.7 ± 6.41 | 6.22 | 0.0013 |
| 5. | 15 | 89 (17.8) | 22.36 ± 2.90 | 29.3 ± 5.39 | 6.94 | 0.005 |
| Statistically significant p value <0.001 at 5 % Significance level. | | | | | | |

Study result shows that MUAC (MEAN± SD) is also lower with their reference value [4] for all the age groups suggestive of malnutrition.

**Table–3 : BMI (MEAN ± SD) of students of private and government school (n=500).**

| Sr No | Age in years | Private school BMI (MEAN ± SD) | No (%) | Government school BMI (MEAN ± SD) | No (%) | P value |
|---|---|---|---|---|---|---|
| 1. | 11 | 16.32 ± 2.4 | 24 (9.6) | 15.31 ± 1.96 | 50 (20) | 0.005 |
| 2. | 12 | 16.16 ± 2.04 | 102 (40.8) | 16.61 ± 2.19 | 43 (17.2) | 0.0132 |
| 3. | 13 | 17.18 ± 2.46 | 50 (20) | 16.58 ± 3.22 | 59 (23.6) | 0.0076 |
| 4. | 14 | 16.94 ± 2.09 | 32 (12.8) | 16.34 ± 2.16 | 51 (20.4) | 0.0013 |
| 5. | 15 | 18.15 ± 2.82 | 42(16.8) | 17.17 ± 2.74 | 47 (18.8) | 0.005 |
| Using Z test Statistically significant at 5% Significance level | | | | | | |

Study results shows that there is significant difference between Mean BMI values of private and government schools. Children of Private schools were better nourished compared to students of Govt. school.

**Table–4: Findings of clinical examination of both private and government schools (n=500).**

| Findings | Private school students No (%) | Government school students No (%) | Total No (%) |
|---|---|---|---|
| Hair – lack of luster and Face – diffuse pigmentation | 12 (4.8) | 20 (8) | 32 (6.4) |
| Face – diffuse pigmentation and Eyes – pale conjunctiva | 15 (6) | 25 (10) | 40 (8) |
| Teeth – caries and discoloration | 14 (5.6) | 30 (12) | 44 (8.8) |
| Pale conjunctiva and Teeth pathology | 25 (10) | 35 (14) | 60 (12) |
| Face, eyes and teeth morbidity | 8 (3.2) | 12 (4.8) | 20 (4) |
| Thyroid enlargement | - | 1 (0.2) | 1 (0.002) |
| Worm infestations | 25 (10) | 41 (16.4) | 66 (13.2) |
| Refractory errors | 70 (28) | 115 (42) | 185 (37) |

*Study result shows that most common morbidity found among the students was refractory errors (37%).

*Pale conjunctiva was found in (25%) students.

*There was one student who showed thyroid enlargement but was not symptomatic probably a pubertal enlargement in girls; how ever she was advised to be checked up and was referred to a physician.

**Fig.1.Association of education of mother with their child nutritional status**

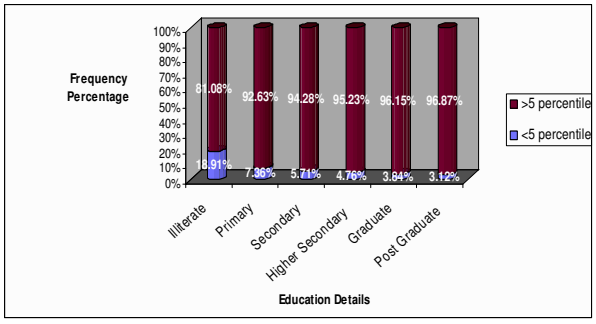


Figure 1 shows that as the education of mother improved, the nutritional status of the child improves and the number of undernourished children decreases.

Chi-square test 21.38 df 5 p value 0.05.

**Discussion :**

A similar study was carried out in the service area of urban health center, Chetla[5], Kolkatta; which showed similar results in which mean values of BMI and MUAC were found to be lower compared to their reference values.

Another study carried out in Chetla[7], among primary school children to find out the nutritional status and various morbidity profile, the commonest morbidity was clinical pallor (28%) which is almost similar to this study(25%). Worm infestation was 13.2% in our study. It was lower compared to a study conducted in Chetla[7] ( 39.81%). However, in the study in Dhotra [8] it was (17.8%) which was more or less similar to our study.

Morbidities and under nutrition were significantly higher among the study population. .Both Mean values of BMI and MUAC significantly shows lower values in comparison with their reference values. Literacy status of mother also plays an important role in the nutritional status of the child. Majority of health problems affecting the school children are preventable by promotion of hygienic practices through proper health education by the teachers who are the first contacts. Education of mother also plays a great role in improvement of nutritional status of the children, which is evident from this study hence encouragement of educating girl children and prevent their school drop outs can help in alleviating the nutritional problems of children. MUAC and BMI are two important tools to measure the nutritional status of children

Most of the studies are based on BMI. MUAC also showed similar results compared to BMI in our study. Hence, it may be mentioned that MUAC can also be used as a tool for measuring malnutrition in children which is an easier method compared to BMI where measuring BMI requires a height board, weighing scales and mathematical calculations.On the other hand assessment by MUAC is easy, feasible and does not required a weighing machine carrying which sometimes becomes quite tiring especially when house to house survey is done.

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## Original article

# Psychosocial impact on the Parents of mentally retarded children in Anand District

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**Abstract**
Background: The diagnosis of mental retardation in a child can trigger a range of emotional responses in parents & across family systems.
**Objectives:** The objective was to know the psychosocial impact on the parents having a child with mental retardation & its relationship with type of mental retardation.
**Materials & Methods**: A cross sectional study of 100 parents of mentally retarded children who were enrolled during 2006 at Mitra Rehabilitation School, a special school for mentally retarded children in Anand district, Gujarat. Study was done using NIMH DISABILITY IMPACT SCALE of National institute for the mentally handicapped, Secunderabad. Statistical Package for Social Sciences (SPSS) software was used to compute the $\chi^2$ and ANOVA tests.
**Results:** There were 45% having mild, 46% with moderate and 9% with severe mental retardation, out of which 69% were male and 31% were female. There was no significant association found between specific thoughts of parents & type of mental retardation. There was no significant loss of support to parents from spouse, family, in laws, relatives, friends and neighborhood. Unemployed fathers had significantly (P value-0.04) more negatively affected relationship than the rest of the fathers. There was not significant association found between type of mental retardation and sibling effects.
**Conclusion:** Parents have enormous emotional problems and suffer from mental worries because of having a child with mental retardation. Family intervention programmes need to be focused on early building and strengthening the natural support systems for the parents.
**Key words-** Psychosocial impact, Family, Mental Retardation.

## Introduction

Mental retardation(MR)is a condition of incomplete development of the mind, which is especially characterized by impairment of skills, manifested during the development periods, which contribute to overall level of intelligence [1]
The diagnosis of mental retardation in a child can trigger a range of emotional responses in parents & across family systems. For some, it will constitute a crisis that requires extraordinary psychological adjustment on a parent's part and contains elements of harm, loss and weakness. For others the birth of a disabled child will be viewed as an unfortunate event, yet one that has positive implications; it may provoke psychological growth in some family members. The initial parental response may be a form of emotional disintegration. This may evolve into a period of adjustment and later into reorganization of the family's daily life. [2]
Mental deficiency and maladjustment has become an alarming universal problem in this existing society.

## Objectives

The objective was to know the psychosocial impact on the parents having a child with mental retardation & its relationship with type of mental retardation.

## Methods

**Study design:** A cross sectional study of psychosocial impact on the parents of mentally retarded children was conducted from August 2007 to August 2008. All children were fulfilling the International Classification of Diseases 10th Revision (ICD-10) criteria of mental retardation and diagnosed as mentally retarded child by psychiatric who regularly visit the school(once a week).[1]
**Sample size:** Mitra Rehabilitation School of Anoopam Mission is the only one special school for mentally retarded children in Anand district. In our school based study, we had included 100 parents of all children with mental retardation who enrolled during 2006 at Mitra Rehabilitation School of Anoopam Mission.
With permission of school principal for the study, information regarding the purpose of the study, method of collecting information,

protection of confidentiality and total time required to collect information was conveyed to all the participants through parents meeting in school.

**Method:** Information was gathered about these children and their parents on specially designed semi-structure sociodemographic sheet. Study was done using NIMH DISABILITY IMPACT SCALE of National institute for the mentally handicapped, Secunderabad.[3] All the interviews were conducted by main author in the homes of the participants with the language of their preference. The psychosocial areas of impact study included in this paper are family support, relationship, sibling effects, specific thoughts & positive impact. Parents were asked open ended questions to elicit information on the impact of having child with mental retardation. Each interview with parent lasted about 15-30 minutes depending upon how elaborate the respondent was.

**Ethical issue:** study was started after getting approval from Human Research Ethical Committee, Pramukhswami Medical College, Karamsad. The study involved the filling up of questionnaires, which would not cause any harm to the subjects. Purpose of survey was explained to the subjects. Informed consent was taken from the subject before inclusion in the study. They were free to discontinue interview at any stage. The information thus obtained was kept confidential.

Analysis: $\chi^2$ (Chi-square) and ANOVA (Analysis of Variance ratio test) tests were used to find out association between different variables with the help of "Statistical Package for Social Sciences" (SPSS) software.

## Results

There were 5% of the mentally retarded children in the age group of less than or equal to 5 years(≤5 years), 50% in 6-12 years,29% in 13-18 years and 16% in 19-28 years [Table 1]. Of the mentally retarded children, there were 69% male and 31% female.

**Table 1: Distribution of mentally retarded children according to Age**

| Age | Mental Retardation | | | |
|---|---|---|---|---|
| | Mild | Moderate | Severe | Total |
| ≤5 | 2(4.4) | 3(6.5) | - | 5 |
| 6-12 | 27(60) | 20(43.5) | 3(33.3) | 50 |
| 13-18 | 10(22.2) | 14(30.4) | 5(55.6) | 29 |
| 19-28 | 6(13.3) | 9(19.6) | 1(11.1) | 16 |
| Total | 45 | 46 | 9 | 100 |

*Figures in Parenthesis indicate percentage, $\chi^2$ value: 6.11, P value - 0.410.

There were 51% children belonged to nuclear family and 49% children belonged to joint family. There was no significant association (P value - 0.954) found between type of the family and type of mental retardation.

98% of the parents were getting support from spouse, relatives, friends and neighbourhood, only 2% had loss of support from them. There was not significant association (P value: 0.93) found between type of mental retardation and support from members.

There was no major impact found on relationship. There was not significant association (P value: 0.61) found between type of mental retardation and relationship. There was also not significant association of relationship with loss of support, sibling effects and specific thoughts. The parents who had more affected relationship also had more loss of support.

Regarding father's occupation, there were 45% of the father were doing service, 39% business, 8% labour,5% farmer, and 3% unemployed. Unemployed fathers had significantly more negatively affected relationship than the rest of the fathers [P value-0.04, Table 2].

**Table 2: Fathers' occupation and affected relationship**

| Father occupation | Affected relationship (Mean difference between two groups) | Group | Group | P value |
|---|---|---|---|---|
| 1.Business | 0.61 | 1 | 5 | 0.005 |
| 2.Service | 0.24 | 2 | 5 | 0.002 |
| 3.Farmer | 0.60 | 3 | 5 | 0.009 |
| 4.Labour | 0.00 | 4 | 5 | 0.002 |
| 5.Unemplyed | | | | |

ANOVA table, df-4, F value-2.20, P value -0.04.

**Table 3:Distribution of parents of mentally retarded children according to sibling effects**

| Sibling effects | *Total (N=100) |
|---|---|
| Getting less time for you | 54 |
| Studies getting affected | 41 |
| Recreational need being compromised | 40 |
| Having added responsibilities | 35 |
| Feeling isolated | 22 |
| Teased by community | 19 |
| Worrying about future | 12 |
| Other effects | 1 |

*Total No. is 100, so numbers are equivalent to percentage

There were various sibling effects shared by parents of mentally retarded children [Table No.3]. There was not significant association (P value: 0.08) found between type of mental retardation and sibling effects [Table 4].

**Table 4: No. of parents according to types of mental retardation with sibling effects**

| Type of MR | Number | Mean | S.D | S.E |
|---|---|---|---|---|
| Mild | 45 | 4.02 | 3.74 | 0.55 |
| Moderate | 46 | 2.70 | 2.85 | 0.42 |
| Severe | 9 | 2.00 | 3.04 | 1.01 |
| Total | 100 | 3.23 | 3.35 | 0.33 |

ANOVA table, df-2(between groups) F value - 2.52, P value-0.08

There were various specific thoughts come to the mind of parents because of having a child with mental retardation. There was no significant association (P value-0.67) found between specific thoughts of parents of mentally retarded children & type of mental retardation.

There was not significant association (P value: 0.828) found between type of mental retardation and positive impact. In our study we found that more than 50% of the parents had positive impact in terms of patience, tolerance, empathy, sensitivity, support and relationship.

**Discussion**

A family who has a child with a mental retardation will experience many challenges such as "repeated physical and emotional crisis, interactive family issues, ruined schedules, and additional expenses, which can create financial burdens for a family".[4] It may be during these times of physical and emotional stress that parents will take out their frustrations on each other, the other children or even the child with the disability or illness.

Prevalence of mental retardation is 3% all over the world. However 75% of them fall into mild mental retardation category, while the rest 25% having IQ (Intelligence Quotient) of below 50 are classified as moderately, severely or profoundly retarded. Severe mental retardation is uncommon.[1] There were 45% having mild mental retardation, 46% moderate retardation and 9% with severe mental retardation. In our study mild mental retardation is 45%, reason for this may be the diagnosis of mild type is usually late & difficult and it is school based prevalence. Generally mild type is diagnosed at later stage due to less awareness in community and when diagnosed it may be converted into moderate type that is easily recognized by community people also. Another possibility that the parents may put their mentally retarded child to the school at later stage where mild would be converted in moderate type or more severe form. Mild mental retardation is usually difficult to diagnose especially during infancy.

Even people with mental retardation can give and receive affection like others. A happy family is one that recognizes this fact and takes pleasure in even their small achievements. In our study 51% children belong to nuclear family and 49% children belong to joint family. There was no significant association (P value - 0.954) found between type of mental retardation and type of the family. This may be due to our Indian cultural system and support from the family.

Family support is conceptualized from a social model of disability involving a consideration of the wider context in which families lives. Parents having mentally retarded children require mutual support from spouse, family and other members of society. The presence of behavioral problems in children is known to produce greater stress for parents. Managing such problems requires more effort and skill in handling them, and hence such support would be considered as important factor.

In our study there was no significant loss of support from spouse, family, in laws, relatives, friends and neighborhood. 98% of the parents were getting support from spouse, relatives, friends and neighborhood, only 2% had loss of support from them. When we see the family perspective, 87% had support from the family while 13% had no support from the family. 90% had support from in-laws while 10% had loss of support from in-laws.

Hodapp and Zigler opined that additional help need to be given to families with mentally retarded children to avoid making families with handicaps into "handicapped families". It is true that when there is support, the stress experienced by parents is less. In the studies reviewed here, it is noticed that main support comes from the spouse.[5]

Moudgil, Kumar and Sharma noticed that those parents who get maximum social and emotional support from spouse and family members, parents, relatives and friends; experience less stress and problems.[6]

A study of facilitators and inhibitors that affect coping in parents of children with mental retardation by Reeta peshaweria, they found that mothers reported "Physical support - family" as a significantly greater facilitator in comparison

to fathers. Since mothers are more under pressure to balance child care needs and household chores, physical support from the family is reported as a relief. [7]

The impact of children with mental retardation on parents and other family members has long been of interest to professionals. Consequently understanding of relationships within the family has grown considerably over time. There was no major impact found on relationship. There were 5% of parents had somewhat affected relationship with spouse, 12% with family members, 12% with in-laws and only 2% with neighbors, friends and relatives. There was not significant association found between type of mental retardation and relationship.

The more dependent the child, the more adverse was his effect on his siblings. In other words, the more responsibility required by the normal siblings (particularly girls), the less likely the handicapped child would be welcomed into the family by his brothers and sisters.

The parents require devotion of more time to mentally retarded child than normal child and this might create bad impact on the siblings. 54% parents felt that they were giving less time to siblings. 41% parent felt that siblings study were got affected because of more attention to mentally retarded child. 35% parents felt that siblings had added responsibilities as they had to take care of mentally retarded child, more frequently seen in older female siblings. 40% sibling's recreational needs were also compromised as parents require more care & time for mentally retarded child. 19% of siblings were teased by community and 22% siblings who felt isolated because of mentally retarded sibling.

Many children can adapt themselves to the presence of a disabled sibling but that they tend to adopt the attitudes of their parents towards the family situation. Jealousy and resentment may also develop, if the handicapped child requires most of his parent's attention, leaving short tempers and impatience for the others. Since siblings may feel jealous, embarrassed and naturally left out due to the extent of attention given to the child with the disability or chronic illness. The parents require devotion of more time to mentally retarded child than normal child and this might create bad impact on the siblings.

Stress of mentally retarded child may give rise to various types of thoughts to the parents that may have negative and positive impact on them. 35% of the parents would never think for another child as they felt that they were unable to take responsibilities of another child and they had already lots of struggle because of mentally retarded child. There were 33% of the parents who had sometimes thought of separating the child from the family so this child did not affect the rest of family members. Parents told that sometimes there might be problem in the family because of special attention, care and unsocial behaviour of the mentally retarded child. 26% of the parents had once also thought of suicide as they had the burden of a mentally retarded child with family responsibilities and many other factors related to these matters.

A study by Mohammadreza Bayat et al.found that the parents of mental retard children experience more psychological problems in aspects of aggression, depression, obsession, anxiety, physical complaint and psychosis than parents of normal children. [8]

Mita Majumdar et al found that the parents of mentally retarded children are more vulnerable to stress than parents of normal children. The high level of stress experienced by parents of mentally retarded children could be related to subjective factors such as a feeling of being restricted, social isolation and dissatisfaction, and might have paved the way for the manifestation of anxiety symptoms.[9]

Mentally retarded children have positive and negative impact on the family of mentally retarded children. In our study we found that more than 50% of the parents had positive impact in terms of patience, tolerance, empathy, sensitivity, support and relationship. The bulk of evidence converged that living with a disabled child causes a great deal of problems both for the family as a system, its members separately and their interaction.

However, certain findings presented a reverse picture. Stainton & Besser reported that mothers of severely disadvantaged children have a positive impact of children with an intellectual disability on the family. [10]

**Conclusion**

Parents have enormous emotional problems and suffer from mental worries because of having a child with mental retardation. Family focused early intervention programmes need to be focused on early building and strengthening the natural support systems for the parents.

**Acknowledgement:** We acknowledge help and support from Mitra Rehabilitation Centre, Mogri and school Principal, Suverna Kadam. I would like to acknowledge all the participants of the

study, without whose responses the study would not have been completed.

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GUJARAT CHAPTER

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## Original article

# Profile of paediatric TB cases in Ahmedabad Municipal Corporation area during year 2007 to 2009

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**Abstract:**
**Background:** Children are especially vulnerable to the effects of tuberculosis, which is often difficult to diagnose in young children and therefore difficult to treat effectively.
**Objective:** To study profile and trend of paediatric TB cases in AMC area during year 2007 to 2009.
**Methodology:** Study: Record based. Sample: 2253 treatment cards of 0-14 years age group. Inclusion: All TB units (10 units) in AMC area. Analysis: SPSS
**Results:** Incidence of Paediatric TB in AMC was 0.48, 0.46 and 0.34/1000 in the year 2007, 2008 & 2009 respectively. East zone showed highest number of cases (701cases, 31.1%). Incidence increased in north and west zones from 2007 to 2009. Below 8 years, males suffered more than females. In 8-14 year age group, females suffered more. Amongst the Extra-pulmonary TB cases, (1279, 56.1%), most common sites in both groups were Lymph nodes (F:50.63%, M:47.30% p=0.25) followed by Abdomen (F:18.19%, M:14.52% p=0.08). Brain–meninges (M:14.37%, F:10.76%, p=0.06) & Pleura(M:12.21%, F:10.60%, p=0.41). The gender differences in different sites were insignificant. Category-3 showed decreasing trends in all age groups. 8-10% of all cases have previous history of anti-TB treatment. Treatment success rate (cured + treatment completed) showed an increasing trend every year during 2007-2009 (94.63%, 95.02%, 95.55%). Deaths due to TB was apparently more in females than in males, but insignificant (F:1.38%, M:0.54% p=0.07). **Conclusion:** Functioning of RNTCP in AMC has shown encouraging results in last three years in the form of decreasing trend in incidence and increasing trend in treatment success rate.
**Key Words:** Paediatric-TB, Trends, AMC, Extra-pulmonary TB, RNTCP

## Introduction:

India is the highest TB burden country accounting for one fifth of the global incidence and it is 17th among 22 high TB burden countries in terms of TB incidence rate.[1] Every year, approximately 1.8 million persons develop tuberculosis, of which about 0.8 million are new smear positive highly infectious cases. Tuberculosis kills about 0.32 million people every year. Two out of every five Indians are infected with TB bacillus. Every day about 5000 people develop the disease.[2,3] Most of new cases of TB and deaths due to TB occur in developing countries where infection is often acquired in childhood.[2] Children are especially vulnerable to the effects of tuberculosis, which is often difficult to diagnose and therefore difficult to treat effectively. Pediatric TB results from failure of TB control in adults.[4] No other chronic infection of childhood comes anywhere close to TB. It is one of the giant killers of children. Childhood deaths from TB are usually caused by disseminated disease.[2]

## Aims and Objectives:

To study profile and trend of paediatric TB cases in AMC area during year 2007 to 2009.

## Methodology:

A record based study was carried out including all treatment units (10 units) of TB in Ahmedabad municipal corporation area. Study period was of 4 months (September to December 2010). Total 2253 treatment cards of 0-14 years age group during 3 years ( 2007-2009) were studied and analyzed using appropriate statistical software. Old categorization of TB under RNTCP has been taken into consideration looking at the study design and period from 2007 to 2009.

## Results and Discussion:

Ahmedabad Municipal Corporation area is divided into six zones namely North zone(NZ), South zone(SZ), East zone(EZ), Central zone(CZ), West zone(WZ) and New West zone(NWZ). According to distribution of cases among various zones, during 2007-2009, highest number of cases were from East zone (31.1%) followed by South zone (22.6 %), North zone (20.9 %), Central zone (10.9%), West zone (8.3%) and New West zone (6.2%). Zones on the eastern side of Sabarmati river viz., East,

South and North zones comprised nearly 75% of all paediatric TB cases. The reason could be industrialised area, more dense population, overcrowding, more migratory population and poverty in these three zones. Contrary to other zones, increasing trend in occurrence of disease was observed in NZ and WZ during these three years. The reason could be greater coverage of outreach population by RNTCP in the recent years.

**Table 1: Age group wise distribution of Paediatric TB cases**

| Age Groups (years) | Females | Males | Total |
|---|---|---|---|
| 0 to 2 | 88 (3.9) | 116(5.2) | 204(9.1) |
| 2 to 4 | 114 (5.1) | 167(7.4) | 281(12.5) |
| 4 to 6 | 137 (6.1) | 177 (7.9) | 314(13.9) |
| 6 to 8 | 155 (6.9) | 177 (7.9) | 332(14.7) |
| 8 to 10 | 178 (7.9) | 157 (7.0) | 335(14.9) |
| 10 to 12 | 225 (10.0) | 145 (6.4) | 370(16.4) |
| 12 to 14 | 259 (11.5) | 158 (7.0) | 417(18.5) |
| TOTAL | 1156 (51.3) | 1097 (48.7) | 2253(100) |

(Figures given in parentheses are percentages.)

**Mean age : 8.24 years**

**SD: 3.99 years (p<00.1)**

Note : Age was recorded in months for each child and Mean & SD were calculated in months. Then both were converted to years.

Out of total (2253) children studied, 48.7% were males while 51.3% were females. (Age range : 15 days to 14 years ) 668 (29.6%) paediatric patients were in 0-5 (pre-school) age group, whereas 798 (35.4%) and 787 (34.9%) belonged to 6-10 (primary school) and 11-14 year (adolescent) age groups respectively. Thus occurrence of disease was equal in both primary school and adolescent age groups. In the study carried out by V K Arora et al 63% of children were female. They also observed that disease was more common in adolescents.[5]

In our study mean age of male children was 8.1± 3.8 years and mean age of female children was 9.3± 3.8 years. Incidence of TB was higher in males below the age of 8 years. However, it was higher in females in the 8-14 years age group. This age difference in the two sex groups was highly significant. (p< 0.01) (Table-1) In the study carried out by S.K. Kabra et al mean age of the children was 7.75 years and sex distribution was almost equal .[6]

These paediatric TB cases were divided into three categories. Category-1 constituted 1190 (52.8%). Category-2 and Category-3 cases were 197 (8.7%) and 866 (38.4%) respectively. (Figure. 1).In the study carried out by S.K. Kabra et al Category-1 constituted 70.4%. Category-2 and Category-3 cases were 2.6% and 27.0% respectively.[6]

**Figure1: Distribution of cases according to category**

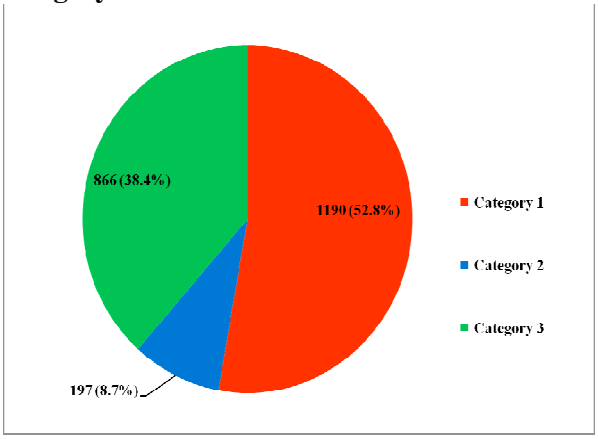



**Table 2: Category wise distribution of cases in defined age group**

| Age groups | Category I | Category II | Category III | Total |
|---|---|---|---|---|
| Preschool (0-5 years) | 375 (31.5) **(56.1)** | 28 (14.2) **(4.2)** | 265 (30.6) **(39.7)** | 668 (29.6) **(100)** |
| Primary (6-10 years) | 398 (33.4) **(49.9)** | 69 (35.0) **(8.6)** | 331 (38.2) **(41.5)** | 798 (35.4) **(100)** |
| Adolescent (11-14) | 417 (35.0) **(53.0)** | 100 (50.0) **(12.7)** | 270 (31.2) **(34.3)** | 787 (34.9) **(100)** |
| Total | 1190 (100) **(52.8)** | 197 (100) **(8.7)** | 866 (100) **(38.4)** | 2253 (100) **(100)** |

Notes:-Figures given in parentheses are percentages of total cases in different age groups in the specific category.Figures given in parentheses in **Bold** are percentages of total cases in different categories in the defined age group.

In our study Category-3 TB cases were higher in primary school age children (38.2%). Category-1 (35%) and Category-2 (50%) were more common in adolescents. (Table.2) whereas in study of V K Arora et al, Category-1 TB dominated the adolescent group. Category-3 TB

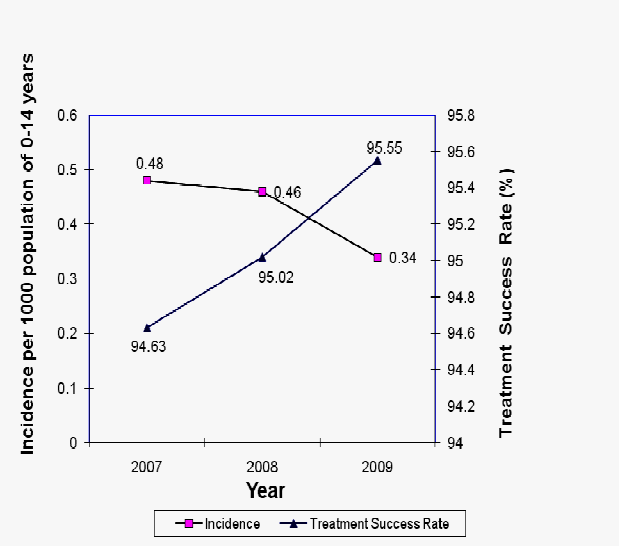
case percentage was higher in pre-school and primary school age groups.[5]

There were 56.8% cases of Extrapulmonary TB (EPTB) (as compared to 15 percent of adults[7] during this period ) followed by 42.8% cases of Pulmonary TB and 0.4% cases of Extrapulmonary+ Pulmonary TB. Thus, despite a predominance of the pulmonary form in adult, the prevalence of EPTB was noticeably high in children. (Table. 3)

**Table 3. Distribution of cases according to disease types**

| Disease types | Cases | Percentage | p-value |
|---|---|---|---|
| **Pulmonary TB (PTB)** | **965** | **42.8** | **---** |
| **Extapulmonary TB (EPTB)** | **1279** | **56.8** | **<0.01** |
| **EPTB + PTB** | **9** | **0.4** | **< 0.01** |
| **TOTAL** | **2253** | **100** | |

**Figure 2: Trend of Incidence per 1000 population of 0-14 years age- group and Treatment Success Rate of Paediatric TB.**




Note: Paediatric TB incidence rate per 1000 children of 0-14 years age group and Treatment Success rate in percentage during the year 2007 to 2009.

Of all the extra-pulmonary TB cases, (1279, 56.1%), most common sites in both sex groups were Lymph nodes (F:50.63%, M:47.30%, p=0.25) followed by Abdomen (F:18.19%, M:14.52%, p=0.08). Brain–meninges (M:14.37%, F:10.76%, p=0.06) & Pleura (M:12.21%, F:10.60%, p=0.41) were more affected sites in males as compared to females. In the study of V K Arora et al, Extrapulmonary TB (EPTB) was seen in 47 percent of children. Among EPTB, lymphadenopathy was seen in 75 % of cases in their study.[5] Wheras in the study carried out by Saumya swaminathan et al lymphadenopathy is the most common (67%), among extrapulmonary manifestations.[7]

Incidence of Paediatric TB among the reported cases at Tuberculosis Units in AMC was 0.48, 0.46 and 0.34 per 1000 children of 0-14 years age group in the year 2007, 2008 & 2009 respectively. (Figure. 2)

In year wise distribution of cases according to category, Category-3 showed decreasing trend in all age groups. {383 (17%) in 2007, 252 (11.2% )in 2008, 231( 10.3%) in 2009}. In age group wise distribution of cases according to category, cases of Category-1 and Category-2 increased as age increased.

Distribution according to disease type revealed that highest number of cases were of extrapulmonary TB (51.6%) followed by sputum smear negative (31.9%), sputum smear positive (7.8%), others (6.7%), treatment after default (0.9%), relapse (0.7%) and failure (0.5%). (Figure.3).

Detection of smear positivity in new cases was found to be the lowest for the preschool age group (1.7 percent) and relatively increased with age for primary school (18.8 percent) and adolescent (79.5 percent) groups. The finding reflects difficulties in obtaining a sputum sample in very young children. In the study of V K Arora et al, the relative prevalence of new smear-positive TB was 5 percent in the paediatric age group. In their study detection of smear positivity in new cases was found to be the lowest for the preschool age group (17 percent) and relatively increased with age for primary school (30 percent) and adolescent (54 percent) groups.[5] S. K. Kabra et al, reported that identification of AFB was possible only in 11% of the patients.[6]

Every year 8.7% patients have history of anti-TB treatment taken previously. This was observed more in private sector (5.9%) than in government sector (2.6%). Weight gain of 1 to 4 Kg. was observed in two-thirds of the patients at the end of treatment which may be physiological or due to effect of treatment. 72.5% patients had taken regular treatment and rest had missed 1 or more doses.

As far as treatment outcome is concerned, treatment completed cases were 86.7 % and 8.3 % cases were cured according to definition of treatment completed and cured of RNTCP[9] followed by treatment defaulted (2%), failure

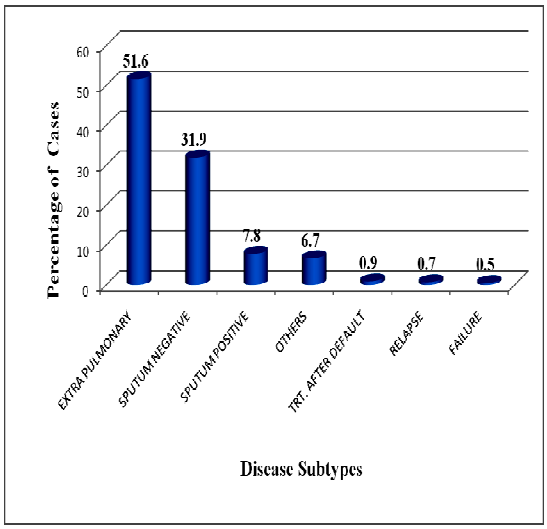
(0.8 %), transferred out (1.2%) and died (1%). (Table 4).

**Table 4: Treatment outcome of Paediatric TB according to definition of RNTCP in either sex.**

| Treatment outcome | Female | Male | TOTAL |
|---|---|---|---|
| Treatment completed | 966 (83.6) | 988 (90.1) | 1954(86.7) |
| Cured | 132 (11.4) | 55 (5.0) | 187 (8.3) |
| Defaulted | 21 (1.9) | 25 (2.3) | 46 (2.0) |
| Transfer out | 10 (0.9) | 16 (1.5) | 26 (1.2) |
| Died | 16 (1.4) | 6 (0.5) | 22 (1.0) |
| Failure | 11 (1.0) | 7 (0.6) | 18 (0.8) |
| Total | 1156 (100) | 1097 (100) | 2253 (100) |

( Figures given in parentheses are percentages)

**Figure 3: Distribution of cases according to disease subtypes.**




Treatment success rate (cured + treatment completed) showed a marginal increasing trend during the study period. (94.63% in 2007, 95.02% in 2008, 95.55% in 2009.) (Figure.2) and this treatment success rate is similar in both male and female paediatric cases.

**Conclusions:**

Overall case distribution was nearly equal in males and females, but cases were higher in males in 0-8 years age group while cases were higher in females in 8-14 years age group.

Increasing trend of disease was observed in NZ and WZ during the study period. Extra-pulmonary (EP) cases constituted 56.8 % of total cases. Sputum smear negative cases were 31.9 % and only 7.8 % cases were sputum smear positive.

The EP sites were similar both in males as well as females. Commonest EP site was lymph node followed by abdomen.

Overall annual occurrence of TB showed a declining trend.

In yearwise trend according to category, category-3 showed decreasing trend in all age groups, but category-1 and category-2 showed increasing trend as age increased.

Every year 8 to 10 % cases have previous history of Anti –TB treatment.

Two thirds of the patients gained 1 to 4 Kg. weight at the end of treatment.

72.5% patients have taken regular treatment.

Over 87% cases were treatment completed and nearly 8 % cases were cured.

Treatment success rate (cured + treatment completed) showed an increasing trend from 94.6% to 95.6% during 2007-2009.

The results of RNTCP in paediatric age group in AMC shows decreasing trend in the occurrence of TB and increasing trend in the treatment success rate during this period.

**Recommendations**:

BCG vaccination status and / status of scar - of the patient should be included in the treatment card.

Family history of TB should be inquired in all patients and needs to be documented in the treatment card.

Mantoux test should not be considered as a diagnostic tool for starting anti TB drugs. Rather, detailed investigation should be done before the child is put on treatment.

Emphasis should be given on sputum disposal training for adults and elder children.

Nearly 28% of cases had missed one or more doses which indicates that the parents need to be motivated for compliance to regular and complete treatment of their children.

Regular follow-up during continuous phase of treatment should include growth monitoring of the children and nutritional education to the parents.

**Acknowledgement:**

We are highly thankful to Dr. R.M. Leuva, City TB Officer, Ahmedabad City TB Control Society, Ahmedabad for facilitating in data

collection and helping to get permission from Director of RNTCP to conduct this study

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Measures to improve public health, relating as they do to such obvious and mundane matters as housing, smoking, and food, may lack the glamour of high-technology medicine, but what they lack in excitement they gain in their potential impact on health, precisely because they deal with the major causes of common disease and disabilities.
Rose, Geoffrey, The strategy of preventive medicine. Oxford (Oxford University Press), 1992,

**"Yet, any disease is viewed as something that happens beyond your will, despite preventive medicine and simple rules of living (correct diet, physical training, suitable vitamins, stress lessening) that could bring about not only the decrease of psychosomatic disease (like refractive errors) but also increasing the level of personal well-being and living standards. Thus, health does not mean absence of disease, but a state of complete well-being concerning all personal aspects (emotional, mental, bodily)."**
**- David De Angelis, The Secret of Perfect Vision: How You Can Prevent and Reverse Nearsightedness**

## Original article

# Prevalence of road traffic accidents and driving practices among young drivers.

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**Abstract**

**Background:** Each year, nearly 1.3 million people die as a result of a road traffic collision— more than 3500 deaths each day, moreover twenty to fifty million more people sustain non-fatal injuries from a collision, and these injuries are an important cause of disability worldwide. Road traffic injuries are among the three leading causes of death for young people (5 to 44 years of age). If timely actions are not taken, road traffic injuries are predicted to become the fifth leading cause of death in the world, resulting in an estimated 2.4 million deaths each year. Considering the issue and concern about younger age group, this study was carried out.

**Objectives:** To find out prevalence of major and minor Road Traffic Accidents and its relation with Driving practices among young drivers. Methodology: A Cross Sectional Study among the school students of 11th and 12th standard going to the tuition classes of Ahmedabad and Vadodara city and students of S.B.K.S. Medical College. Data was collected with the help of a Pre-designed, Pre-tested questionnaire for road traffic accidents and driving practices. Results: Majority of drivers were in 18 to 19 years of age (49.7%), Male and from Vadodara city. Total Prevalence of Accidents was 41.4%, 20.4% had major accidents and 29.2% had minor accidents. Safe Driving practices like use of Helmets and Seat Belt while driving was less followed (11.5% and 40.2% respectively) while unsafe practices like use of mobile while driving was practiced by 42.4% of drivers and it was related with high prevalence of RTAs. Fault of Pedestrian and Poor road condition are the major reason of their RTAs for young drivers. **Conclusion:** Prevalence RTAs are high (41.4%) among young drivers and it is related with high speed of driving, use of mobiles with driving and not following safety measures while driving. Fault of pedestrian and poor road condition are the main reason for the RTA for the young drivers.

**Keywords** : Road Traffic Accidents, Young Drivers,

## Introduction

Due to the fast pace of modernization, basic needs including the requirement of a vehicle for transportation are expanding rapidly and resulting in an epidemic situation of injury everywhere including developing countries[1]. Each year nearly 1.3 million people die as a result of a road traffic collision, more than 3500 deaths each day. Moreover, twenty to fifty million more people sustain non-fatal injuries from a collision, and these injuries are an important cause of disability worldwide. Ninety percent of road traffic deaths occur in low- and middle-income countries, which claim less than half the world's registered vehicle fleet[2].

Unless immediate and effective actions are taken, road traffic injuries are predicted to become the fifth leading cause of death in the world, resulting in an estimated 2.4 million deaths each year[2].

According to the World Health Report 2002, of the global burden of injury, 30.3% morbidity and 28.7% mortality occurred in the South-East Asia Region[3]. Road traffic injuries are among the three leading causes of death for people between 5 and 44 years of age and most common cause of death for people between 5 to 25 years of age[2].

The reasons for higher rate of RTIs amongst young drivers are minimal information about road safety and limited practice, Immaturity and inexperience particularly in the necessary driving skills and capabilities[4]. Apart from these, young drivers are having "risk-taking behaviour", high levels of 'Sensation Seeking' or 'Thrill Seeking' behaviour. Such sensation-seeking frequently focuses on risky behaviours, including while driving a vehicle or crossing a road. Sensation-seeking has been shown to rise between the ages of 9 and 14 years, peaking in late adolescence or the early 20s, and then declining steadily with age[5,6].

These deaths are largely preventable through the concerted efforts of institutions and civil society and by implementing effective road safety measures that tackle leading risk factors and enable a comprehensive and safe road traffic system all over the world. Considering the importance of the Road Traffic Accident (RTA) issue, World Health Organization had taken the "Road Safety Is No

Accident" as a theme for World Health Day -2004. First United Nation Road Safety Week was observed from 23rd to 29th April, 2007 and the United Nations General Assembly resolution in March-2010, proclaimed period from 2011 to 2020 as a "Decade of Action for Road Safety" with the goal to stabilize and reduce the fatalities due to Road Traffic Accidents.

With official launching of the campaign on 11th May, 2011, activities have been launched as national events in each and every part of world.

Keeping in mind the importance of RTAs for young people this study was planned to find out RTA prevalence and driving practices among young drivers.

**Objectives of Study:**

To find out the prevalence of Road Traffic Accidents among young drivers.

To find out the driving practices and its relation with Road Traffic Accidents among them.

**Methodology:**

Type of study: A Cross sectional study among young drivers selected from the tution classes in the city of Ahmedabad and Vadodara and students of SBKS Medical College.

**Sample Size:** Total sample size was 197, out of that 67 were students from tuition classes and 130 are students of SBKS Medical College.

Out of total 197, 6 students were not driving any type of the vehicle, so they were excluded from the study.

**Method of study:** Two Tuition classes, one from Ahmadabad and one from Vadodara, were selected based on the permission given from their authority. Remaining subjects were selected from the studens of SBKS, Medical College. Data Collection was carried out by Intern Doctors posted in Community Medicine department with the use of a predesigned –pretested questionnaire. Questionnaire was having questions about personal details, Road Traffic Accident details and driving practices.

Data collected was analyzed by Epi-info, Version 3.5.

**Ethical Issues:**

Prior Permission of the authority of tuition classes was obtained before starting the study. Confidentiality of the data was ensured.

Ethical Clearance was obtained from Local Ethics Committee before staring the study.

**Results and Discussion**

Age of drivers was ranging from 15 years to 25 years with Mean age of 20.28 ± 2.21. Most of the drivers (49.7%) were in age group of 18 – 20, 15 drivers were under 18 years of age, majority of them were male (60%) and were from Vadodara (71.7%) and 68% were medical students of SBKS Medical Institute and Research Center.

**Table-1 Demographic Profile of Young Drivers**

| Age Group | Number of Drivers | Mean ± SD |
|---|---|---|
| 15 – 17 years | 15 (7.9%) | 20.28 ± 2.21 |
| 18 – 19 years | 95 (49.7%) | |
| 20 – 21 years | 44 (23.0%) | |
| 22 – 25 years | 37 (19.4%) | |
| Gender | Number | |
| Male | 115(60.2%) | |
| Female | 076(39.8%) | |
| City | Number of students | |
| Vadodara | 137 (71.7 %) | |
| Ahmedabad | 054 (28.3%) | |
| Category | Number of Students | |
| Medical Students | 130 (68.1%) | |
| Student from Tution classes | 061 (31.9%) | |

Age of drivers was ranging from 15 years to 25 years with Mean age of 20.28 ± 2.21. Most of the drivers (49.7%) were in age group of 18 – 20, 15 drivers were under 18 years of age, majority of them were male (60%) and were from Vadodara (71.7%) and 68% were medical students of SBKS Medical Institute and Research Center.

**Table-2 Vehicle driving patterns of young drivers:**

| Type of Vehicle Driven | Number |
|---|---|
| Two Wheelers | 79 (41.4%) |
| Four Wheelers | 08 (4.2%) |
| Both | 104 (54.5%) |
| Avg. Speed of Driving | Number of drivers |
| <40 km / hr | 30(15.7%) |
| 40–50 km/hr | 64 (33.5%) |
| 50-60 km/hr | 63 (33%) |
| >60km | 34 (17.8%) |

More than 54% of drivers drive both "Two Wheeler" and "Four Wheeler" while only 4.2% drive only a four wheeler. Almost half of the drivers drive with the average speed of >50 k.m. / hour.

As per the table-3, total prevalence of accident among young drivers was 41.4%, 17 (8.9%) had both major and minor accidents while driving, 56(29.3%) had minor accidents and 40 (20.9%) had major accidents which involved hospitalization for at-least one day. Major accidents mainly involved fracture (45.9%) and

Cut injury (32.4%) requiring suturing of the wound.

**Table-3 Prevalence of Accidents and its relation with driving practices**

| Type Accidents | Number | |
|---|---|---|
| Minor Accident | 56 (29.3%) | |
| Major Accident | 40 (20.9%) | |
| All types | 79 (41.4%) | |
| Relation of Accident With type of Vehicle driven | | |
| Two Wheeler | 33 (41.8%) | $X^2$ = 0.96 , P = 0.63 |
| Four Wheeler | 02 (25%) | |
| Both | 44 (42.3%) | |
| Relation of Accident with Avg. speed of driving | | |
| <40 km / hr | 13 (43.3%) | $X^2$ = 1.33 , P = 0.72 |
| 40–50 km/hr | 23 (35.9%) | |
| 50-60 km/hr | 27 (42.9%) | |
| >60km | 16 (47.1%) | |

While comparing the RTA among young drivers with the type of vehicles they are driving, RTA prevalence is higher among two wheeler drivers.

While comparing with average driving speed, the prevalence was higher among drivers whose average speed of driving was > 60 km/hr., though the data is not statistically significant, but if we compare the average driving speed with prevalence of major accident, it was significantly higher among drivers with higher speed of driving.

**Table -4 Prevalence of Safe driving practices:**

| Use of Helmet while driving Two wheeler | Number |
|---|---|
| Always | 21 (11.5%) |
| Sometimes | 67 (36.6%) |
| Never | 95 (51.9%) |
| Use of Seat Belts | Number |
| Always | 45 (40.2%) |
| Sometimes | 51 (45.5%) |
| Never | 16 (14.3%) |
| Other Practices | Number |
| Use of Mobile while driving | 81 (42.4%) |
| Driving without License | 30 (15.7%) |
| Driving with Learning license | 23(12.1%) |

Regular use of safety measures like helmet and seat belts while driving was less prevalent among young drivers, only 21 (11.5%) are using helmets regularly while driving two wheelers and only 45 (40.2%) use seat belt regularly while driving four wheeler.

81 (42.4%) of young drivers use mobile phones while driving and 30 (15.7%) are driving without a driving license.

**Table-5 Relation of Safe Driving practices and RTAs:**

| Relation between use of Helmet and RTAs | | |
|---|---|---|
| Always | 08 (10.4%) | $X^2$ = 1.46 , P = 0.48 |
| Sometimes | 25 (32.5%) | |
| Never | 44 (57.1%) | |
| Relation between use of mobile and RTA prevalence | | |
| Using mobile while driving | 38 (46.9%) | $X^2$ = 1.79 , P = 0.18 |
| Not using mobile while driving | 41 (37.3%) | |

From above table we can observe that prevalence of accident was higher among the person not wearing helmet regularly while driving and using mobile phones while driving, though the difference is not statistically significant.

**Table-6 Reasons of their Accidents and for not using Helmets and Seat belts as per the young drivers.**

| Reason for Accident* | Number |
|---|---|
| Fault of a Pedestrian | 37 (37.4%) |
| Poor Road Condition | 34 ( 34.3) |
| High Speed | 08 (8.1%) |
| Animal on Road | 09 (9.1%) |
| Reason for not using Safety Measures (helmets/seat-belts) | Number |
| Feeling uncomfortable | 32% |
| Not a habit | 22.7% |
| Not required for a short distance of driving | 17.4% |
| In hurry | 17% |

**Multiple answers were allowed*

As per the drivers, having road traffic accidents reasons for their accidents were "Fault of a pedestrian" (37.4%), Poor Road Condition (34%), High speed (8%) and Animal on Road (9%). For not using safety measures while driving the main reasons were "Feeling uncomfortable (32%), Not a habit (22.7%), "Not requiring it for a short distance (17.4%) and forget it in hurry (17%).

**Conclusions:**

Prevalence of Road Traffic Accidents are high (41.4%) among young drivers, and almost 21% of total driver had a major accident involving hospitalization of at least 24 hours.

Major accidents mainly involved fracture injuries (45.9%) and cut injuries (32.4%) requiring suturing of the wound.

Unsafe driving practices like high driving speed, not using helmets and seatbelts while driving and using mobile phones while driving are very common among young drivers and higher prevalence of RTAs was observed among drivers with this kind of unsafe driving practices.

Common reason for their RTA among young drivers was the "Fault of a Pedestrian" and "Poor Road condition" while common reasons for not using helmets and seat belts while driving are "Feeling uncomfortable", "Not a habit" and "short duration of driving"

**Recommendations:**

Considering the high prevalence of Road Traffic Accidents among young drivers, school based Road Safety awareness programmes should be periodically conducted.

Traffic rules and speed limits should be strictly followed by all the drivers including young age drivers. Vigilant watch and punishment system should be established by RTO department for violation of the rules.

United Nations has proclaimed year 2011 to 2020 as "Decade of Action for Road Safety : 2011 – 2020" and activities all over the world has been launched since 11th May, 2011. As a part of the global this initiative, action should be taken to make young people aware about their "major killer" all over the world and to take preventive steps against it.

Acknowledgement:

I am very thankful to Dr. Jayant Mulchandani, Dr. Priyam Padia and Dr. Khyati Panchasara, intern doctors of SBKS MI & RC for their help in data collection for this study.

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- Almost 1.3 million people die each year on the world's roads, making this the ninth leading cause of death globally. If steps are not taken, this will rise to death of 1.9 million people annually by year 2020.
- In addition, road crashes cause about 50 million non-fatal injuries every year, many of them leading to disabilities.
- 90% of these casualties occur in Low income countries.
- RTA is the No. 1 cause of death for young people worldwide and by year 2015, it will be a leading heath burden for a children > 5years in developing countries.
- ROAD TRAFFIC ACCIDENTS ARE PREVENTABLE and Considering the importance of this public health issue, U.N. general assembly resolution in March-2010, proclaims period from 2011 to 2020 as "Decade of Action for Road Safety" with the goal to stabilize and reduce the fatalities due to Road Traffic Accidents.
- Activities under the decade were launched on 11th May, 2011, in each and every part of the world.
- The Road Safety Tag is adopted as the official symbol for the United Nations' Decade of Action for Road Safety 2011-2020, which aims to reduce road deaths and injuries across the world.
- By wearing the Tag you are demonstrating your support for the Decade of Action, and your personal commitment to be safe on the road.

**TOGETHER WE CAN SAVE MILLION OF LIVES**

**Original article**

# Burden of anemia among the pregnant women in rural Area

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**Abstract:**

**Background:** Anemia is the most common nutritional deficiency disorder in the world. As per NFHS-3 (2005-6) survey in rural Maharashtra 56.4% pregnant women are anemic. This underlines the problem of anemia among pregnant women in rural area and need of research on this issue. Objective: study the prevalence of anemia among pregnant women of rural area.

**Study design:** Community based cross sectional study conducted in 16 villages under primary health centre, Valsang, Dist: Solapur (Western Maharashtra). Sample size: 827 pregnant women. Sample selection: Every pregnant woman registered under register-15 of sub-centre was included in the study. Hemoglobin estimation of every pregnant woman was done by Sahli's method during her first antenatal visit in 12-20 weeks of gestational age.

**Results:** Mean age of the pregnant women was 22.72 ± 3.25 years. The overall prevalence of anemia was 92.38%. Among the total 827 pregnant women 328 (39.66%) were mild anemic, 406 (49.09%) were moderate anemic and 30 (3.63%) were severe anemic. Conclusion: High anemia prevalence (92.38%) indicates that the anemia continues to be a major public health problem in rural area.

**Key Words:** anemia, pregnancy, rural area, prevalence

**Background:** Anemia is the most common nutritional deficiency disorder in the world. WHO has estimated that prevalence of anemia in developed and developing countries in pregnant women is 14 per cent in developed and 51 per cent in developing countries and 65-75 per cent in India. [1] Anemia is one of the important factor which decides the outcome of pregnancy. Anemia among pregnant women includes increased risk of low birth-weight or prematurity, perinatal and neonatal mortality, increased risk of maternal morbidity and mortality. Even though National Nutritional Anemia Prophylaxis Program (NNAPP) started in 1970 with objective to reduce the anemia prevalence but no satisfactory achievement yet. As per NFHS-3 (2005-6) survey in rural Maharashtra 56.4% pregnant women are anemic. [2] This underlines the problem of anemia among pregnant women in rural area and need of research on this issue.

**Method:**

Study design: Community based cross sectional study. Setting: This study was conducted in 16 villages under primary health centre, Valsang, Dist: Solapur (Western Maharashtra). Sample size: all (827) pregnant women registered under register -15 of sub-centre and attending antenatal clinic either at village level or health facility level during 1 April 2010 to 31 March 2011 were included in the study. Sample selection: Every pregnant woman registered under register-15 of sub-centre was included in the study. Hemoglobin estimation of every pregnant woman was done by Sahli's method during her first antenatal visit in 12-20 weeks of gestational age. If the registered woman was not attended to antenatal clinic then on the next day she was visited by health worker and hemoglobin estimation was done through home visit. WHO criteria was used to classify the severity of anemia[3] Results were analyzed and presented as percentages.

Results: Out of total 827 pregnant women, 266 (32.16%) were primigravida, 367 (44.38%) and 194 (23.46%) were of second gravida and third gravida & above respectively. Maximum 719 (86.94%) women were in the age group 20-29 years. Mean age of the pregnant women was 22.72 ± 3.25 years. The overall prevalence of anemia was 92.38%. Among the total 827 pregnant women 328 (39.66%) were mild anemic, 406 (49.09%) were moderate anemic and 30 (3.63%) were severe anemic.

**Table- 1. Prevalence of Anemia among Pregnant Women**

| Severity of Anemia | Number | Percentage |
|---|---|---|
| Normal (> 11 g/dl) | 63 | 7.62 |
| Mild Anemia ( 10-10.9 g/dl) | 328 | 39.66 |
| Moderate Anemia (7-9.9 g/dl) | 406 | 49.09 |
| Severe Anemia (<7 g/dl) | 30 | 3.63 |
| Total | 827 | 100.00 |

**Discussion:** The anemia prevalence in the present study was very high i.e. 92.38% as compared with the studies of Umesh Kapil et al [4] (78.8%) in Delhi slum area and Toteja GS et al [5] (84.9%) in 16 districts study of India were anemic. Priyali Pathak et al [6] also found less percentage (85.4%) of anemia among pregnant women of Delhi slums. The prevalence of mild anemia in the study of Umesh Kapil et al [4] and Priyali Pathak et al [6] was 29.4% and 30.4% respectively which was lower than the present study (39.66%). But the prevalence of moderate anemia observed by Umesh Kapil et al [4] (47.8%) and Priyali Pathak et al [6] (53.2%) was similar to presnt study (49.09%). 3.63% pregnant women in present study were severe anemic similar finding was observed by Umesh Kapil et al [4] (1.6) and Priyali Pathak et al [6] (1.5%) but in the study of Toteja GS et al [5] high (13.1%) percentage of severe anemia was found..

**Conclusion:** Very high prevalence of anemia (92.38%) indicates that the anemia continues to be a major public health problem in rural area.

Recommendation: Strategic efforts are needed to broaden the coverage of Iron and Folic acid distribution and its consumption.

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**Health is not, in the minds of most people, a unitary concept. It is multi-dimensional, and it is quite possible to have 'good' health in one respect, but 'bad' in another.**

**Health can be defined negatively, as the absence of illness, functionally, as the ability to cope with everyday activities, or positively, as fitness and well-being. It has also been noted that in the modern world, health still has a moral dimension.**
**Blaxter, Mildred (1990), *Health and lifestyles***

**Clearly, health and disease cannot be defined merely in terms of anatomical, physiological, or mental attributes. Their real measure is the ability of the individual to function in a manner acceptable to himself and to the group of which he is a part.**
**Dubos, René (1987), *Mirage of Health. Utopias, progress, and biological change***

## Original article

# A study of breast feeding practices among infants living in slums of Bhavnagar city, Gujarat, India

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**Abstract**:
**Research Question:** What is the situation of Breast feeding practices among infants living in slums of Bhavnagar city?
**Objective:** To study the Breast feeding practices and the influence of literacy and cultural factors on breast-feeding practices in infants of Bhavnagar urban slums.
**Study Design:** Community based Cross-sectional study. **Setting:** infants living in slums of Bhavnagar city. **Study Tools:** pre tested semi structure questionnaire. **Participants:** Actual Study was conducted among 840 children in the age group of 0 to 5 years were selected for study using 30-cluster methodology. **Ethical Concern:** No ethical issues were involved. **Inclusion Criteria:** Healthy under five year children**. Exclusion criteria:** Currently ill child **Study Period:** April 2009 to June 2009. **Study Variable:** Literacy, Prelacteal feeding practices, Colostrum Practices, Time of initiation, Place of delivery. **Statistical Analysis:** Chi-square test and percentages.
**Results:** 61.9% of newborns received prelacteal feed. Illiterate mother (85.2%) practices more prelacteal feeding than literate mother (50.9%) which was statistically significant in our study (<0.01).. all home delivered infants received prelacteal feeding and half infant receive prelacteal who were delivered in hospital and difference was statistically significant in our study ($p<0.001$). 38.1 % of newborns received breast feeding within hour. 49.1% and 14.8% of literate and illiterate mothers respectively had started breastfeeding within one hour ($p<0.01$). 36.9% of newborns received colostrum in our study. Statistically significant association found between type of family and colostrum feeding practices ($p<0.05$).**Conclusion:** Present study shows 40% of newborns received right practices of breast feeding.
**Key Words**: Breast feeding practices

## Introduction:

Malnutrition is like an iceberg; most people in the developing countries live under the burden of malnutrition. Pregnant women, nursing mothers and children are particularly vulnerable to the effects of malnutrition. Pre-school children constitute the most vulnerable segment of any community. Their nutritional status is a sensitive indicator of community health and nutrition. About 128 million (70%) of the world's 182 million stunted children aged under five years live in Asia[1].

Breast Feed is the first fundamental right of the child. The initiation of breast feeding and the timely introduction of adequate safe and appropriate complementary foods in conjunction with continued breast feeding are of prime importance for the growth, development, health and nutrition of infants and children everywhere. However, there are many cultural practices associated with infant feeding of which certain undesirable practices need to be discouraged. One in every third malnourish children in world lives in India[2].

UNICEF and WHO launched Baby Friendly Hospital Initiative in 1992 as a part of global effort to protect promote and support breast feeding.

Looking to the importance of infant feeding practices, the present study was conducted with objective to study the infant feeding practices particularly focusing on breastfeeding among infants living in slums of Bhavnagar city.

## Material and Methods:

The 30 cluster community based cross sectional study was conducted in the urban slums of Bhavnagar city from April to June 2009. A list of urban slums of Bhavnagar city was obtained from Bhavnagar Municipal Corporation. A cluster is a 'slum' selected proportion to population size. For this selection a complete list of all the Slums of Bhavnagar Urban as per census 2001 with its population obtained from the Bhavnagar Municipal Corporation.[3] Total 30 slums were selected from the Bhavnagar Corporation by using cluster sampling technique. Considering prevalence of malnutrition as 47 % at a level of 5% precision, a sample size arrived as 383. As we were doing cluster sampling, taking design effect 2, a

sample size of 766 was arrived at. Considering 10% non-response and obtaining a figure divisible by 30, a sample of 840 was required. From each cluster 28 respondents were to be taken. After the course study, full data set of 840 children. (455 boys and 385 girls) between 0 to 5 years available were studied. Collected data was analyzed for various parameters and cross tabulation was done using Epi Info (version 3.5.1.) For the present study, the focus was on infants of the slum areas.

**Result and discussion:**

In present study, 84 infants up to 6 months of age were studied of whom 60.7% were males and 39.3% were female. 52 (61.9%) infants out off 84 had received prelacteal feed (78.8% female, 51% male). Illiterate mothers (85.2%) practiced more prelacteal feeding than literate mothers (50.9%) and the observed difference according to education of mother was statistically significant in our study (<0.01). 77.8% of nuclear families were giving more prelacteal than three generation (47.1%) and joint family (52.6%). The difference was statistically significant (p<0.05) for type of family and prelacteal feeding practices. In present study, we observed that all home delivered infants received prelacteal feeding and 50% of infants who were delivered in hospital received prelacteal feed. The difference in type of delivery of infant and prelacteal practices was statistically significant in our study (p<0.001).

**Figure: 1 Constituents of prelacteal feed practice in less than 6 months infants (n=52)**

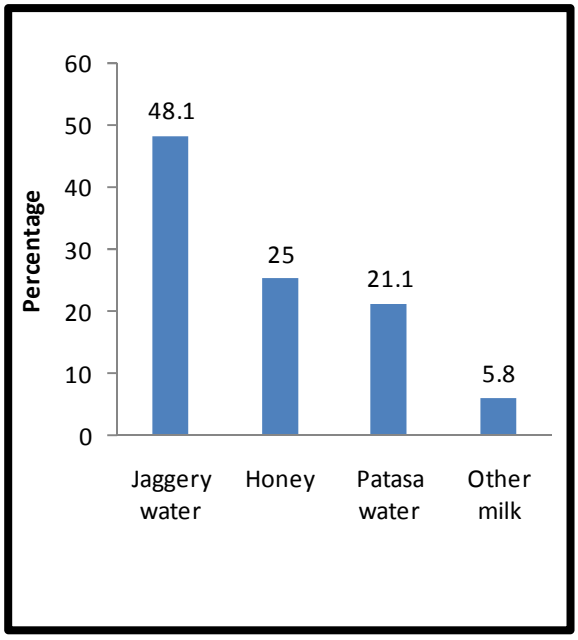



**Table 1: Distribution of prelacteal feed practices less than 6 months of infants (n=84)**

| Parameters | | Prelacteal feed given (n=52) (61.9%) | Chi square |
|---|---|---|---|
| Gender | Male(n=51) (60.7%) Female(n=33) (39.3%) | 26 (51.0%) 26 (78.8%) | Chi sq.: 5.44 p=0.0196 |
| Religion | Hindu(n=75) (89.3%) Muslim(n=9) (10.7%) | 48 (64.0%) 4 (44.4%) | Chi sq.: 0.60 p=0.4363 |
| Education of Mother | Illiterate(n=27)(32.1%) Literate(n=57) (67.9%) | 23 (85.2%) 29 (50.9%) | Chi sq.: 7.75 p=0.0054 |
| Type of Family | Nuclear(n=36) (42.9%) 3generation(n=17)(20.2%) Joint (n=31) (36.9%) | 28 (77.8%) 8 (47.1%) 16 (52.6%) | Chi sq.: 6.82 p=0.0329 |
| Socio Economical class | Class II (n=15) (17.9%) Class III (n=28) (33.3%) Class IV (n=30) (35.7%) Class V (n=11) (13.1%) | 11 (73.3%) 16 (57.1%) 14 (46.7%) 11 (100%) | Chi sq: 10.82 p=0.0127 |
| Place of Delivery | Home (n=20) (23.8%) Govt.Hospital (n=29)(34.5%) Pvt.Hospital (n=35) (41.7%) | 20 (100%) 13 (44.8%) 19 (54.3%) | Chi sq: 16.75 p=0.0002 |

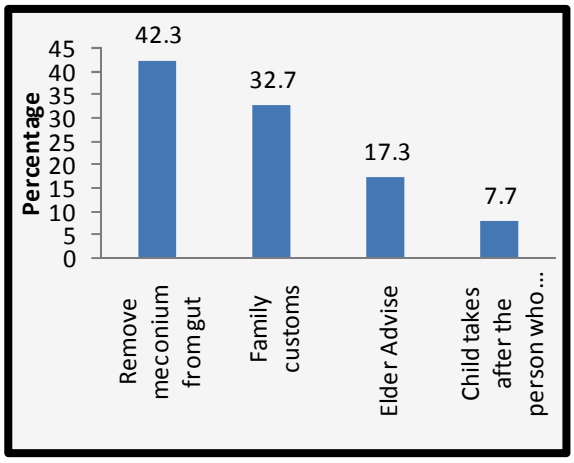
In our study, the prevalence of prelacteal feeding was higher than other studies, and most important reason for this was family custom (32.7%) and relatives' advice (17.3%). This suggest that population of urban slums of Bhavnagar believe more in customs and religion. Also, 42.3% of infants received prelacteal feed because of the wrong belief that the prelacteal remove the meconium ("Pet no Bagad", "Garbh samaya Balak je Pani Pi gayu hoi te") from the gut. It is a very common belief that, child takes after the person who gives prelacteal feed to the child. Not only Grandparents but the young people, who recently married also believed this.

**Table: 2 Distribution of infants up to 6 months in relation to initiation of Breastfeeding. (n=84)**

| Parameters | | Within 1 hour (n=32) (38.1%) | P value |
|---|---|---|---|
| Gender | Male (n=51) (60.7%)<br>Female(n=33) (39.3%) | 21 (41.2%)<br>11 (33.3%) | Chi sq.: 0.24 p=0.6220 |
| Religion | Hindu (n=75)(89.3%)<br>Muslim(n=9) (10.7%) | 28 (37.3%)<br>4 (44.4%) | Chi sq.: 0.002 p=0.9586 |
| Education of Mother | Illiterate(n=27)(32%)<br>Literate(n=57)(68%) | 4 (14.8%)<br>28 (49.1%) | Chi sq.: 7.75 p=0.0053 |
| Type of Family | Nuclear(n=36)(43%)<br>3gene(n=17)(20%)<br>Joint (n=31) (36.9%) | 12 (33.3%)<br>8 (47.1%)<br>12 (38.7%) | Chi sq.: 0.93 p=0.6280 |
| Socio Economical class | ClassII(n=15) (17.9%)<br>ClassIII(n=28) (33%)<br>ClassIV(n=30) (36%)<br>ClassV(n=11) (13.1%) | 8 (53.3%)<br>12 (42.9%)<br>12 (40.0%)<br>0 (0.0%) | Chi sq.: 8.56 p=0.0357 |
| Place of Delivery | Home (n=20) (23.8%)<br>Govt. Hospital (n=29) (34.5%)<br>Pvt. Hospital (n=35) (41.7%) | 0 (0.0%)<br>11 (37.9%)<br>21 (60.0%) | Chi sq.: 19.42 p=0.0001 |
| Birth order | 1st order birth (n=16) (19.0%)<br>2nd order birth (n=26) (31.0%)<br>3rd order birth (n=28) (33.3%)<br>≥ 4th order birth (n=14) (16.7%) | 2 (12.5%)<br>18 (69.2%)<br>8 (28.6%)<br>4 (28.6%) | Chi sq.: 17.55 p=0.0015 |

Only 38% of infants received breastfeeding within 1 hour of birth (41.2% in male and 33.3% in female). Educated mothers were more aware regarding breast feeding initiation as 49.1% literate mothers had started breastfeeding within 1 hour as compare with illiterate mother (14.8%). The difference was statistically significant according to education of mother and initiation of breast feeding ($p<0.01$). Statistically significant association between Birth order of the child and time of initiation of breast feeding. Showed 12.5% of the first-born child, 69.2% of the second born child, 28.6% of the third born child and 28.6% of the fourth and more than forth born child.

**Figure: 2 Distribution of reason for prelacteal feed practice in less than 6 months infants (n=52)**




Most common reasons for delay in initiation of breastfeeding, which was mainly Family restriction (36.5%). Also certain medical cause like Caesarean Section (23.1%), Mother was Ill (9.6%), Baby was in NICU (11.5%) and less secretion of milk (13.5%). In small proportion (5.8%) medical staff advice the late initiation of breast feeding, this may be due to they had wrong knowledge or not aware about for breastfeeding practices.

**Figure 3: Reason for late initiation of breast feeding**

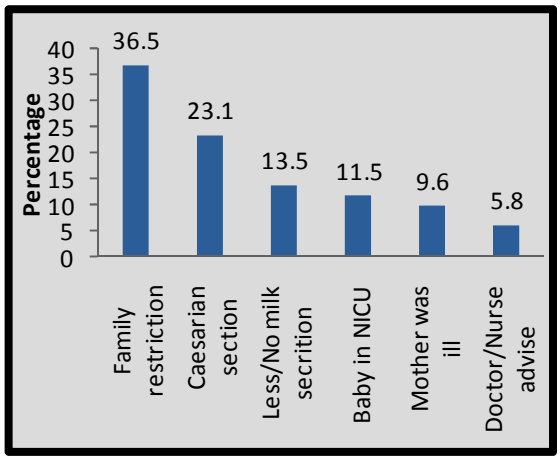
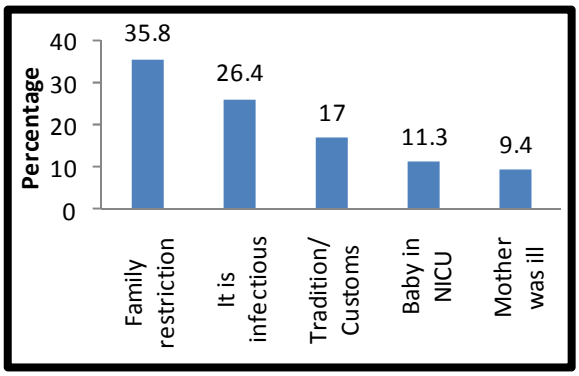


**Table: 3 Distribution of infant up to 6months of age in relation to Colostrum feed practices.**

| | Parameters | Colostrum feed given (n=31) (36.9%) | |
|---|---|---|---|
| Gender | Male(n=51)(60.7%)<br>Female(n=33)(39.3%) | 17 (33.3%)<br>14 (42.4%) | Chi sq.: 0.37<br>p= 0.5406 |
| Religion | Hindu(n=75) (89.3%)<br>Muslim(n=9) (10.7%) | 28 (37.3%)<br>3 (33.3%) | Chi sq.: 0.0170<br>p=0.8913 |
| Education of Mother | Illiterate(n=27)(32.1%)<br>Literate(n=57) (67.9%) | 9 (33.3%)<br>22 (38.6%) | Chi sq.:0.05<br>p=0.82 |
| Type of Family | Nuclear(n=36)(42.9%)<br>Three generation (n=17) (20.2%)<br>Joint (n=31) (36.9%) | 7 (19.4%)<br>9 (52.9%)<br>15 (48.4%) | Chi sq.:8.34<br>p=0.0154 |
| Socio Economical class | Class II(n=15) (17.9%)<br>ClassIII(n=28)(33.3%)<br>ClassIV(n=30)(35.7%)<br>ClassV(n=11) (13.1%) | 8 (53.3%)<br>6 (21.4%)<br>12 (40%)<br>5 (45.5%) | Chi sq.: 5.08<br>p=0.1655 |
| Place of Delivery | Home (n=20) (23.8%)<br>Govt. Hospital (n=29) (34.5%)<br>Pvt. Hospital (n=35) (41.7%) | 16 (80.0%)<br>19 (65.5%)<br>18 (51.4%) | Chi sq.: 4.57<br>p=0.1016 |
| Birth order | 1st order birth (n=16) (19.0%)<br>2nd order birth (n=26) (31.0%)<br>3rd order birth (n=28) (33.3%)<br>≥ 4th order birth (n=14) (16.7%) | 5 (31.3%)<br>15 (57.7%)<br>2 (7.1%)<br>9 (75.0%) | Chi sq.:20.20<br>p=0.0001 |

Out of 84 infants, 31 (36.9%) received colostrum in which 33.3% were male and 42.4% female. 66.7% of illiterate women and 61.4% literate women had rejected colostrum. The difference was not statistically significant. According to family type, 52.9% of three generation family infants received colostrum, while 48.4% and 19.4% infants of joint and nuclear family respectively received colostrum. This suggests that rejection was more in nuclear families compared to other types of families. The difference was statistically significant ($p<0.05$). In our study,42.19% hospital delivered babies and 20% of home delivered babies received colostrum. That means hospital delivery and knowledge provided by health staff can improve attitude of parents towards colostrum feeding. This difference according to place of delivery was statistically not significant ($p>0.05$).

**Figure: 4 Frequency distribution of reason for not giving colostrum (n=53)**




35.8% of infants were not given colostrum due to relatives' advice. 26.4% of infants were deprived of colostrum due to their parent's wrong belief that colostrum is infectious. 79.3% of reasons for not giving colostrum can be reduced by proper health education during ANC period. They said "Sharuat nu peelu dudh pivadava thi Chep lage to e to kadhi devu pade", some told "chiknu dudh to chepi j hoye", "sharuat nu dudh to nav mahina thi eme ne em hoye etle vasi thai gau hoy etle e balak ne na apay."

In short, out of 84 infants up to 6 months of age, 61.9% had received prelacteal feed. Prelacteal feed practices were more prevalent amongst illiterate mothers (85.2%), nuclear families (77.8%), social class V (100%) and all home delivery infants. According to NFHS-3 report (2005-2006) 57% newborns received prelacteal feed (57.3% male and 57% of female) and 67.5% of the illiterate mothers gave prelacteal feeds.[4] Similar results were found in a study by Chatterjee Saurav et al (2008) which showed that 54.5% of newborns received prelacteal feed, and out of them 66.7% belonged to illiterate mothers.[5] Ideally nothing but breast

milk should be given to the infant up to 6 months of age, but wrong belief and cultures lead people to think that prelacteal feed is good for newborn. But they are not aware that it is one of the main causes of infections. Half of infants received "Jaggery water" as prelacteal, while other received honey (25%), "patasa water" (21.1%) and "cow or goat milk" (5.8%). The common reason for prelacteal feed practices was the concept of "removing meconium from gut" (42.3%) and "family customs" (32.7%).

According to IYCF (2006) guidelines, Government of India recommends that initiation of breastfeeding should begin immediately after birth, preferably within one hour[1]. In our study 38.1% of infants started breast feeding within 1 hour of birth. A practice of initiation of breastfeeding within 1 hour was significantly associated with education of mother, socioeconomic class, and place of delivery and birth order of infants. 49.1% infants of literate mother and 69.2% infants of 2nd birth order had received breast feeding within one hour, while none of infants belonging to social class V and home delivered received breastfeeding within one hour. Common reasons for late initiation of breast feeding were family restrictions (36.5%) and Caesarian section (23.1%), in our study.

As per the data in NFHS-3 report, breast feeding was initiated within 1 hour in 30.3% in urban region of India.[4] In another study by Kumar D (2006) urban slums showed breastfeeding within 1 hour as 6.3% and 32.6% within 24 hours.[6] In a study by Kulkarni et al (2004) in urban area, 61.3% of literate and 43.7% of illiterate mothers had initiated breastfeeding within 6 hours of delivery[7] and the result was similar to present study. In the study by Kumar D (2006) in urban slums, reasons for the late initiation of breastfeeding was the family restrictions (38.8%) and Social customs and Religious belief (25.2%).[6] As colostrum is thick secretion, it was considered unhealthy. This shows their lack of knowledge regarding physiology of milk secretion. So there is a need for proper counselling of mother regarding the same.

In our study, 36.9% of infants received colostrum feeding. There was significant association between colostrum feeding practices with family type (52.9% infants of three generation family) and birth order of infants (75% of $\geq 4^{th}$ birth order). Common reasons for not giving colostrum feeding were "family member told (35.8%)", "It is infectious (26.4%)" and "tradition (17%)"

Different studies reported varying figures regarding the rejection of colostrum, 15.9% in Kumar D et al (2006) study[6], 58.7% in MICS report (2006) of Bhavnagar urban slums[8], 82.9% in Srivastava S. P. et al (1994) study[9], 29% in a study by Banapurmath C. R. et al (1996) [10] and 3.6% in Chatterjee Saurav et al (2008) study[11]. This variation was mainly due to different types of customs prevalent in India and also lack of awareness regarding the importance of colostrum was relatively less in some areas. The various reasons for not giving colostrum are enumerated in table 3.

In a study, Bhardwaj et al (1991) observed that the common reason for not giving colostrum was religious belief (63.6%), followed by reasons that it was thick (12.8%), unclean (11.8%) and its removal helps in easy suckling for the child (11.8%).[12] Similar reasons were found in our study. We observed that there was wrong belief in community that colostrum was dirty, infectious, thick, religious belief. This wrong belief in community should be changed by creating awareness about the importance of colostrum to their child.

**Conclusion:** The present study shows 38.1% infant did not receive prelacteal feeding, 38.1% infants received breastfeeding within 1 hour and 36.9% infants received colostrum. This shows that right practices of Breast feeding according to IYCF guideline in urban slums of Bhavnagar city was available only to two fifth of infants.

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**GUJARAT CHAPTER**