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# INDEX

**Content** | **Page No.**

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# INDEX

**Content** **Page No.**

# Neo-Natal Survival Strategies and Challenges

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India has been at the forefront of the global effort to reduce child mortality and morbidity. Its continuous commitment and ongoing effort, has resulted in 59% reduction in "Under 5 child mortality and morbidity" since 1990. [1] India has proven that it can reach even the most hard-to-reach and vulnerable children, with affordable lifesaving interventions, as evident from its polio eradication strategies.

Despite tremendous efforts, India is still contributing more than any other country to global under 5 mortality and newborn deaths. Given its demographic and cultural diversity, India faces numerous challenges with significant rural – urban, poor rich, gender, socio economic and regional differences.

Since the progress of a developing country is measured by its infant mortality, prime focus is to reduce infant mortality and if trends of last 25 years are observed, it can be concluded that majority of infant deaths are in neonatal period (< 1 month); maximum in 1st week (74.1 %), with highest on day 1 (39.3%) followed by on day 3 (10.2%). [2] Neonatal Mortality Rate (NMR) (29/1000 live births)is contributing for 70% of Infant Mortality Rate (40 / 1000 live births).[3] This implies that if further reduction in infant mortality is demanded, then reduction in neonatal mortality is necessary.

Four states, Bihar (NMR 28/1000live births), Madhya Pradesh (39/1000live births), Uttar Pradesh (37/1000live births) and Rajasthan (35/1000live births)[4], are contributing maximum in neonatal deaths, counting to country's more than 50% and global 14%.[1] While the states like Kerala having NMR as low as below 10 (NMR = 7/1000 live births). [1]

Similarly, if we see the trends in rural and urban India, there is still a vast variation; the neonatal mortality rate in rural India is as high as 33 / 1000live births and in urban its 16 / 1000 live births.[1]

So, if a child is born in an urban area of Kerala or in a rural area of Uttar Pradesh we have to think differently as the chances of survival is significantly different in two states. Most of the newborns are dying because of preventable causes. Prematurity is the leading cause of newborn deaths contributing 35 %, followed by birth asphyxia (20 %), pneumonia (16 %) and sepsis (15 %). [5]

In order to reduce these preventable causes of newborn deaths, there is need for certain strategies. Government has done a lot, in this regard as is evident by trends in last 25 years. (NMR reduced 44% since 1990 to 2012). [1]

On the same lines, I have been sharing my experience of the strategy which I have used to reduce NMR, which is "HAPPY";

"HAPPY" stands for:

**H** Hypothermia prevention

**A** Asphyxia Prevention

**P** Provisions for Antenatal, Natal, Intranatal Care

Prevention of Infection

Promotion of Referral

**P** Prevention of Prematurity and Low Birth weight

Prevention of Congenital Malformations

Promotion of Small Family norms

**Y** Yes to Exclusive Breast Feeding

Government is running following strategies under National Health Mission (NHM), which are as follows:

A) Janani Suraksha Yojna (JSY)
B) Integrated Management of Neonatal and Childhood Illness (IMNCI)
C) Navjat Shishu Suraksha Karyakram (NSSK)
D) Janani Shishu Suraksha Karyakram (JSSK)
E) Facility Based Newborn Care (FBNC)
F) Home Based Newborn Care (HBNC)

G) Rashtriya Bal Swastha Karyakaram (RBSK)
H) India Newborn Action Plan (INAP)

These all strategies are having one or the other component of "HAPPY".

So in other words we can say that, in order to have good newborn survival even in a small village of our country, we need to implement "HAPPY" at very basic levels, but to achieve that the journey is not so easy. We have certain challenges, without overcoming them; we will not be able to achieve the target for the year 2030. To meet such challenges and in continuation to strategies, government laid down target for NMR to be achieved by 2030[1], which has to be brought down to a single digit i.e.,<10/1000 live births.

But if we go by present pace of reducing NMR, that is Average Annual Reduction (AAR of 3.4%) [1], it won't be possible to achieve our targets. So to achieve single digit NMR by 2030, we need to increase AAR to 5.8%.To achieve this Annual Reduction Rate there are certain challenges which are to be overcome:

If we see broadly, there are three main challenges: (3 Q's)

a) Quantity
b) Quality
c) Questionable Policy

Population of India is 121 crores[6]. With current birth rate of India (21.4)[3] annually 2.5 crore newborns are taking birth every year. In comparison to that, India is having merely 418 SNCU's (Sick New Born Care Units), 1554 NBSU's (New Born Stabilization Units), 13167 NBCC's (New Born Care Corners).[4] Similarly the situation for sub-centers, Primary Health Centers (PHC), Community Health Centers (CHC) is also poor, and the list is too long. Let's us take the example of the biggest state in the country as far as the population is concerned.

Considering the population of Uttar Pradesh (UP) as 20 crores (19.6 Crores as per census 2011) [7] and birth rate of UP as 27.2[7], every year UP is producing 54 lakh newborns, of which 28% [8] are low birth weight babies which counts for around 15 lakhs new borns. Out of which about 15%require facility based newborn care, that is 2 lakh newborn every year need facility based newborn care. If we see the present situation of UP, we are able to produce merely 119 pediatricians/year[9], having only 15 SNCU's , 92 NBSU's and 1430 NBCC's.[1] But the burning question is, are these adequate to save the two lakh newborn needing facility based care? If we consider occupancy of each bed in SNCU, 7 days (which is most of time is more) and each SNCU is having 10 beds (approx.), then we will be able to provide services for only 7800 newborns per year. It shows how much we are lacking and what a big challenge is infront of us to improve coverage and quality of care, as far as neonatal care is concerned. Similar situation is there for many parts of our country.

***Neonatal Mortality is the major obstacle in reducing Infant Mortality Rate as well as Under 5 Mortality. To reduce the neonatal mortality, reduction in incidence of Low Birth Weight is essential. To reduce Low Birth Weight, we must have robust mechanism of provision of quality antenatal care as well as intranatal care.***

To conclude, it's a game of numbers and whether we will be able to achieve this or not, only future can tell. However, we need to have a major thrust towards manpower and infrastructure development as well as to control growing population, without which every strategy, howsoever it may sound good on paper, is not going to change ground realities.

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# Remedial Education in Medical Colleges

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**Introduction :**

Remedial Education is a multifaceted approach, tailoring remedial intervention plans to a student's specific needs. Remedial therapy focuses on skills rather than on content. It is offered to students who need (pedagogical/didactic) assistance. It differs from special education which is designed specifically for students with special needs. Remedial education can be designed for any students, with or without special needs; the defining trait is simply that, they have reached a point of under preparedness, regardless of why. The bulk of remedial, courses focus on advancing under prepared students' literacy skills (English and reading) or mathematics skills.[1,2]These skills include visual discrimination, perceptual organization, sequencing, abstract reasoning, auditory processing, sound recognition, blending, mathematical operations, focusing and eye tracking. However, remedial courses can also be offered for other subjects such as science or study skills.

Underperformance among undergraduates, in medical schools is not well established or defined; yet the identification and remediation of physicians, who are not performing up to acceptable standards is central to quality care and patient safety. Though many colleges have published studies relating, admissions criteria with student academic achievement in pharmacy school [3-8], little evidence of support schemes available to medical students following examinations, exists.

This article is a concept paper on remedial education for medical college students and does not discuss the students' admission criteria and student demographics relating to academic achievement, as this is a policy of government. To characterize policies of medical schools regarding struggling medical students, those at risk of receiving a grade of less than pass because of problems with knowledge, clinical skills, professionalism or a combination of these items can be another area of discussion.

Evidence shows that six to fifteen percent of health professions students experience academic difficulties and these percentages are increasing.[9, 10] Poor academic performance and scholastic failure can result in student's dropping out of professional programs while still responsible for the large debts incurred. Although most faculty members feel a sense of commitment to helping their students succeed, some feel that academic progression is the student's responsibility and that faculty members should not have to remediate students at the graduate or professional level. As an example in this paper, I aimed to explore the perceptions of students support. I recently undertook a focus group discussion (FGD) with undergraduate medical students in their 2nd professional course, who had failed a summative examination. Non academic problems contributing to low performance included; language problem as most of them had their schooling in a medium other than English, problems in adjustment to life outside home, lack of self confidence, lack of mentor support, personal health problems and problems with intake of healthy diet.

Academic problems included; difficulty in managing study time, inability to retain what is studied, inability to pick out what is important in the text, difficulty in coping with the large amount of content to be learnt, spending too much time on cell phones and social media sites, lack of motivation to study, not knowing how much to write and what to write in exams, need for guidance regarding text books.

The learning needs as identified by the participants included; a revision class- say, of two to four hours duration, an extra revision exam before the summative examination, a practice on exam question writing skills, peer support and need for mentorship to improve learning. However, the example quoted above on perception of participants of one FGD may not represent worldwide view of the issue. Some of the other problems as identified in a

study by Mysorekar [11] include; lack of concentration, examination anxiety, inability to plan study, improper sleep and lack of motivation. Academic failure among undergraduate medical students is due to a variety of academic and non academic problems. And it is seen that these students do not perform as expected and it is also expected that students study the core areas well to be certified as pass.

In addition to identifying students who are not progressing, medical colleges and schools can devise preventive strategies/ measures in form of remediation. Educational remediation is the act of providing a remedy to a problem or a process. Accreditation standards and guidelines for medical schools must have a remediation policy. Modifications in the curriculum and teachers' approach can help low performers improve their performance, confidence and self esteem and sustain their motivation. Effective remediation policies should include early detection of problems in academic performance, strategies to help students develop better approaches for academic success and facilitation of self directed learning.

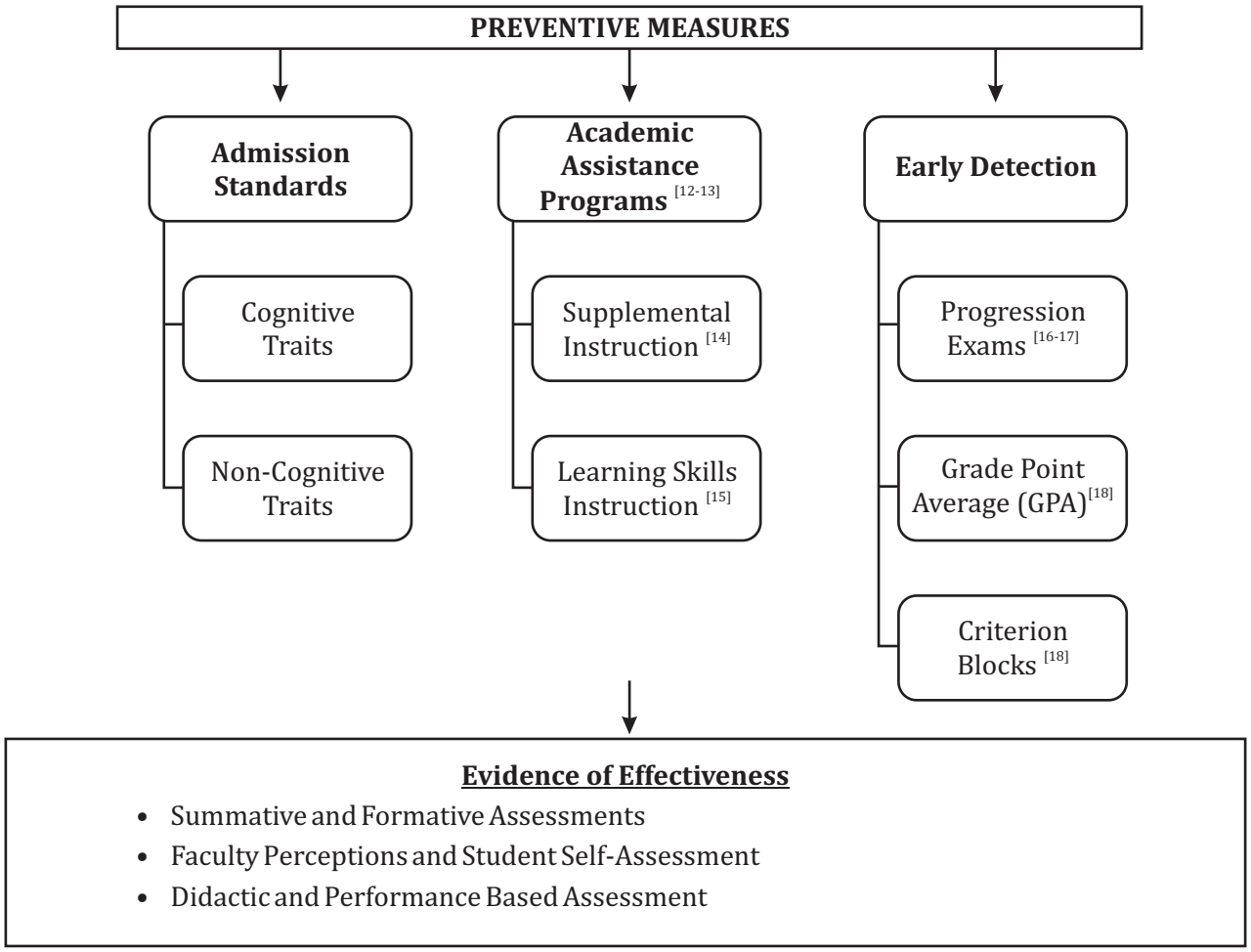
**COURSE DELIVERY:** There can be an active debate on course delivery. Researchers continue to investigate and make recommendations for effective remedial education models. Remedial education courses can be delivered in many ways. Two main areas for formulation and evaluation of remediation plan for medical schools can be:

(A) Preventive strategies to minimize the need for remediation and

(B) Remediation approaches to correct deficiencies

**(A) Common preventive strategies to minimize the need for remediation are summarized below (Figure1):**

**Figure 1: Preventive strategies to minimize the need for remediation**



**(a) Admission standards:** One strategy for minimizing the need for remediation is to admit only the most highly qualified students to a medical school. Characteristics that are accurate predictors of a student's success in the program include cognitive and non-cognitive traits. Cognitive traits should be assessed in form of college admission tests and non-cognitive traits, to test motivation, professionalism, responsibility and others. As stated earlier, this paper does not mainly discuss the students' admission criteria and student demographics relating to academic achievement, as this is a policy of government. But it is seen that large number of students (200-250) are admitted in a batch in medical colleges due to demand for more doctors, this compromises the quality of teaching by reducing focus on students. However some questions to ponder at this point of time are, "Are students selected on the basis of merit from a large cohort applying for admission in need of remedial education? Can an orientation / counseling session before seeking admission for students and parents regarding the academic load and other demands/ responsibilities minimize the need and number requiring remedial support?"

**(b) Assistance Programs emphasizing either; correcting deficits to make more effective learners or; teaching content- specific skills and strategies.** Academic assistance is often required at transition points from high school to undergraduate training and from undergraduate to graduate or professional. These programs attempt to develop confident and motivated learners who can concentrate, manage their time, set goals, synthesize information from multiple sources, solve problems, develop strategies for studying and test taking and perform self assessment of their learning.[12, 13]

**Some of the ways in which assistance programs can be delivered are:**

**1. Supplemental instruction:** is a proactive support system developed to increase the academic success of students at the point of trouble instead of waiting until the end of the semester when it is too late. It is basically proactive remediation. The supplemental instruction sessions do not re-teach course material, but emphasize thinking, reasoning, analyzing, organizing, problem solving and practical application of ideas.[14]

**2. Learning skill Instruction:** In a proactive effort to avoid difficulties arising from suboptimal learning and study habits, some professional schools can institute programs to develop learning skills such as a week-long orientation course that introduces them to the demands of the program and its approaches to learning like the foundation course as proposed by Medical Council of India (MCI) Vision 2015. [15]

**(c) Early Detection:**

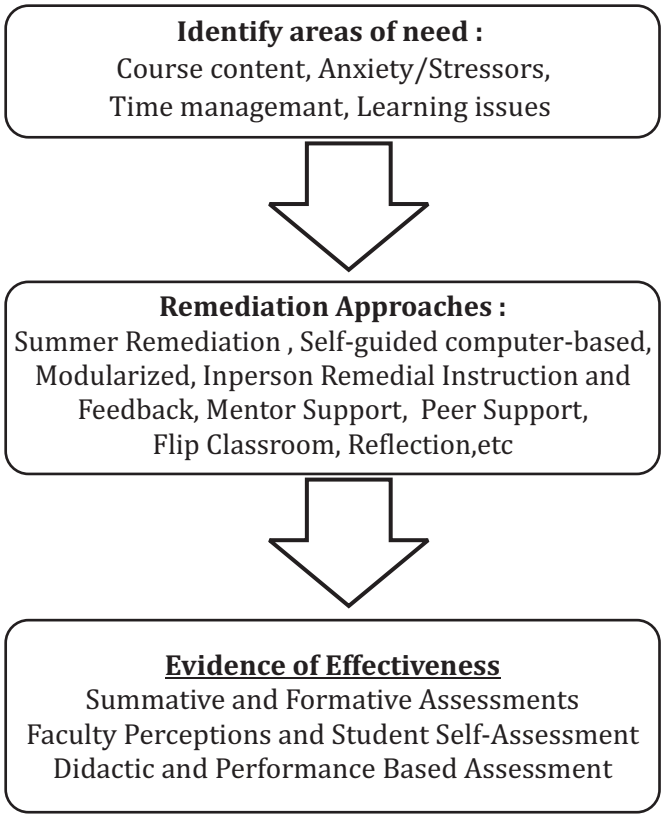
**(I) Mile Marker or Progression Examinations :** The early detection of potential problems is essential for introducing timely interventions that may circumvent future remediation efforts. In addition to course grades, progress examinations are being increasingly employed as an assessment tool to measure knowledge and skills and can affect a student's progression in a program. Progression examinations can be utilized in a variety of ways in an assessment program. Some examples are: benchmarking results of year-end examinations in comparison to other schools in the nation, determining progress, and (most relevant to the present article) identifying students who would benefit from remediation.[16, 17]

**(II) Other early detection strategies :** implemented by colleges and schools of pharmacy include grade point-average (GPA) alerts and criterion blocks within a course. Although no comparative studies exist with regard to the effectiveness of these strategies, they represent logical approaches to early detection of students who are at risk for remediation. Several colleges and schools of pharmacy have GPA alert points that are different from the minimal GPA necessary to progress. For example, a school may require a minimum GPA of 2.2 to progress, but students receiving a GPA under 2.5 are sent to academic advising and counseling to address issues and circumvent major problems before they occur. The progression policy at the Pacific University of Oregon School of Pharmacy incorporates a modified block curriculum with a pass/no pass criterion for each block. A student scoring less than 90% on any

biweekly examination on Fridays must return the following Monday for reexamination. One consequence of this policy is that students who are in trouble are identified quickly.[18]

**(B) Remediation approaches to correct deficiencies (Figure2)**

**Figure 2 : Remediation approaches to correct deficiencies**




**1. Summer remediation course/ Coaching Classes :** for example a web based summer remediation course for medical students who have received a failing grade during their initial course in medical microanatomy is offered by Dr. Janet Smith and Haviva Goldman.[19] These courses can include: readings, assignments, practice problems, discussions, self-study of course materials.

**2. Modularized courses that target particularly student skill.**

**3. Self guided computer- based courses that adapt to student skill deficiencies.**

**4. In person remedial instruction and regular feedback.** Feedback also from the students honestly accepted by the teacher would reduce the areas not well understood by students, thereby need of remedial action.

**5. Mentor support :** Faculty members who are empathetic can provide good mentor support to low performers.

**6. Peer interactionsand group study** may help to increase the efficacy of student study in preparation for examinations and encourage practice of behaviors conducive to a career as a health professional.[20]

**7. Flip classroom :** Flipped classroom simply means inverted classroom where students seek information before and not after the class(like traditional class) and come to the class well prepared to share together in an interactive learning process rather than a spoon fed teaching session.[21]For remediation the information can be provided on core skills.

**8. Reflection :** Reflection is a meta-cognitive process that creates a greater understanding of both the self and the situation so that future actions can be informed by this understanding. Self-regulated and lifelong learning have reflection as an essential aspect, and it is also required to develop both a therapeutic relationship and professional expertise.[22] There are a variety of educational approaches in undergraduate, postgraduate and continuing medical education that can be used to facilitate reflection, from text based reflective journals and critical incident reports to the creative use of digital media and story telling. The choice of approach varies with the intended outcomes, but it should also be determined by the user since everyone has a preferred style. Guided reflection, with supportive challenge from a mentor or facilitator, is important so that underlying assumptions can be challenged and new perspectives considered. Feedback also has an important role to enhance reflection.

It is important to note/speculate that if such students need remediation it probably reflects more on education system than on them. It also raises the issue of, "How prepared is a person, with MD in a discipline, as a teacher? A good clinician/ consultant

may not be a good teacher. Other questions to ponder are, "Is there a relationship between students not attending classes regularly/attending but not mentally present and therefore a need for remedial action? Are assessments at examination fair? Are students really in need of remedial action or more importantly, are there many more who need remedial action but are missed by system which passes 85%-90% by lowering expectations from students?

**Duration and Structure:** Remedial classes are not necessarily semester or quarter length classes. Some institutions offer crash courses over a few days or weeks in order to bring students up to speed quickly. These classes usually have tests and homework like any other, often with a focus on review to ensure comprehension by students. Most remedial classes stress basic concepts (must to know) that must be understood before complicated ideas can be applied. In Community Medicine, for example, teachers can/might stress on epidemiology of priority health problems of India. By getting these concepts firmly in hand, students can better focus on learning complex applications of them like prevention and control.

Remedial teaching can be given for a period of 6 weeks to 3 months, once or twice a week at school or in the remedial teacher's own practice.

Classes are often small with a focus on high teacher student interaction and can take place at a time feasible to the student and the teacher, and also to accommodate various needs of the students. In the course of the class, the teacher will bring students up to speed so that they have skills comparable to those of their peers.

Any student required to take remedial classes should not feel ashamed. These classes can be conducted by discontinuing system of "Casual Batch" and allowing them to be with the regular batches, this might help. These courses only help students gain a better understanding of a particular subject. By reviewing and focusing on the basics, students become better prepared to keep up with the advanced course/ classes. Remedial courses can also teach students better study and learning habits, to help them succeed where they might have otherwise found difficulty.In remedial education students are usually given assessments to determine their level of competency and can be enhanced through student and faculty feedback.

**Effectiveness :** The question that rises is whether successful completion of a remedial course guarantees student's success in college. The literature provides limited evidence for the effectiveness of remedial courses on outcomes such as persistence to graduation, quality of performance in subsequent courses and grade point average.

**SUCCESS FACTORS :** Kozeracki (2002)[23] distinguishes seven commonly cited elements that are associated with student success in developmental programmes: 1. Orientation, , and placement are mandatory for new students, 2.Clearly specified goals and objectives are established for courses and programmes, 3.The adult learning theory is applied in the design and delivery of the courses, 4. The courses are highly structured, 5. The programme is centralized or highly coordinated, 6. Counseling, , and supplemental instruction components are included, 7. The social and emotional development of the students is taken into consideration.

Other research suggests that "bridge" programs that integrate basic skills and remedial education with higher-level content or technical training can produce substantially better results than traditional remedial programs.[24]

**Conclusion and Future Directions :** To conclude, an optimal system of remediation begins with prevention. Effective remediation policies should strive to identify students early (first 1-2 years) in their medical career, use proactive strategies to help students develop better approaches to academic success, and combine academic counseling and mentoring to facilitate self-directed learning. Several observations/statements made and questions raised in this article need additional research on remediation in medical schools and health care education across India and abroad, in order to make sound decisions in developing effective policies.

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# An Evaluation of Factors Affecting Non Adherence to Anti-Retroviral Therapy

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**Abstract :**

**Introduction :** Non adherence has been considered as one of the factors responsible for emergence of resistance to ART. There are many factors (like patient related, regimen related, social/environmental and adverse effect related factors) thought of responsible for non adherence to ART. The current study focuses on the assessment of factors affecting non adherence to ART. **Objective :** To assess the factors affecting non adherence to ART. **Method :** This is a prospective study involving 200 people living with HIV/AIDS. The non adherence was measured using pill count method and factors responsible, were assessed using a pre structured performa. **Results :** Higher non adherence was seen amongst > 60 years age group, females, unemployed, illiterate, living as widow/widower and belonging to lowest socio economic class. **Conclusion :** As evident from results from the study, the socio demographic groups showing higher non adherence should be provided special attention and motivation through special counseling sessions. Devices like alarm clock can be used to remind patients about medication.

**Key words :** Anti Retroviral Therapy, Non adherence, Adherence

## Introduction :

A major worry with scaling up of antiretroviral therapy (ART) in settings with restricted resourcesis the emergence of drug resistant viral strains due to suboptimal adherence and the transmission of these resistant viral strains in the population. There are many factors thought of responsible for non adherence to ART. Apart from the quality of services provided by the health care system, many socio cultural factors also play part in determining the attitude of patients towards ART. This attitude is ultimately reflected in patients' adherence to ART and their CD4 count response and virological response. Recent surveys of knowledge, attitude and behavior regarding treatment adherence have provided insight into patient and service provider's perceptions of many factors influencing the practice of medicine taking. [1, 2]Other factors that seem to have a stronger relationship to treatment adherence than demographics include: 1) patient's knowledge of the treatment plan and regimen; 2) presence and management of side effects/symptoms; 3) cultural and health beliefs towards disease and treatment; 4) presence or absence of a social support system; and 4) specific co-morbidities such as substance abuse and mental health problems.[3]

Following are the hypothesized predictors of ART adherence.

- **Patient related Factors :** It is expected that patients who have more-positive attitudes toward ART, greater self-efficacy toward adherence and higher literacy levels will be more adherent with ART.
- **Regimen Factors:** The patients receiving less complex antiretroviral regimens and regimens that fit less well with the other daily activities will be less adherent.
- **Social/Environmental Factors:** The patients with more social support to be more adherent. Ease of availability of ART at affordable cost at the nearest center also aids adherence.
- **Adverse effects:** The side effects of Anti retro viral drugs vary from mild form (which hardly influences patient's attitude towards drug) to severe form (which may compel the patient to stop that drug). Following are some important adverse effects developing at various stages of therapy.

**NON ADHERENCE AMONG CHILDREN**

There were 2.5 million children living with HIV in world and 4, 20,000 children were newly infected in year 2007. [4] Adherence may be more complex in children compared to adults due to many factors including reliance on care giver who may themselves be ill or may not be the child's parent, complex dosing regimens, lack of availability of paediatric fixed dose combinations, poor drug palatability, difficulty with taking tablets/capsules and interference with daily routine. [5, 6]Adherence estimates of 50 to 75% have been reported, well below the required 95% to achieve optimal viral suppression. [6, 7]Health service challenges as well as individual factors such as poor socio economic circumstances, poor literacy and the prohibitive cost of liquid drug formulations necessitating tablet/capsule administration to very young children can be additional potential barriers.

**Method :**

Present study is unique in the sense that no similar prospective study has been done in the past, in Gujarat, to assess the factors affecting non adherence among patients on ART. The vacuum created by lack of such studies, prompted and motivated authors to conduct the present study.

This is a prospective study conducted at ART centre, Civil Hospital, Ahmedabad spanning over 18 months in duration. There is no previous data available on prevalence of non adherence in Gujarat. At the time of initialization of study, total number of patients enrolled at the ART centre was around 2000. In the current study, 10% of total patients enrolled at ART centre, were taken as sample size which is 200. Currently this ART centre (which is centre of excellence) is providing ART and other services like Integrated Counseling & Testing Centre (ICTC) Prevention of Parent to Child Transmission (PPTCT) laboratory investigations and dietary advices free of cost.

A cohort of 200 PLHA on ART was selected from PLHA attending ART centre. The study sample was selected by stratified random sampling technique. The strata used were male: female: paediatric age group in proportion of 6:3:1 respectively. The inclusion and exclusion criteria are as follow.

***Inclusion Criteria***

1. Only those patients who have never been non adherent during their treatment were included. Adherence of past treatment was ensured by past record of pill count recorded in white card of the patient.
2. Only those patients whose treatment has been started in the ART Centre, Civil Hospital, Ahmedabad were included in the study.

***Exclusion Criteria***

1. Those patients whose ART has been started in the other setup were not included.
2. Children without a known permanent & identifiable care taker were not included in the study

***Method of Data Collection :***

After receiving approval from ethical committee, PLHA were enrolled in the study by using above mentioned selection method. Informed consent was ensured before enrolment of each PLHA.

Along with enrolment, base line data about each sampled PLHA was collected using preformed and pre tested baseline data form. These patients were interviewed at monthly interval, every time they visit ART centre for next 18 months. The follow up data collection was done by either face to face interview or telephonic interview.

At the time of follow up, adherence to ART was measured by pill count method (monthly).

**Pill count method at ART Center, Civil Hospital, Ahmedabad**

The ART drugs were supplied as one tablet fixed dose combination containing the 3 drugs. The patients were instructed to swallow a single tablet of such a combination every 12 hours. The time of 12 hourly doses were determined according to patients' comfort. They were always dispensed an intact bottle containing 60 tablets. The patients were also advised to come back for refill at least 2 or 3 days before exhaustion of the dispensed doses (Usually on 28$^{th}$ day). The doses remaining with the patients were compared with the total doses dispensed to him/her

at the time of last visit. By this comparison number of doses missed by the patient can be known.

**Attrition of cohort during 18 months of study period**

Data was collected for next 18 consecutive months from the date of initiation. At the time of last follow up, 177 of all the enrolled PLHA were attending the ART centre. There was attrition of 23 subjects in during the study, which is 11.5% of original sample size. Out of these 23 subjects, 2 patients expired, 9 were lost to follow up and 12 PLHA were transferred to other ART centres, during the study period.

**Definitions of non adherence**

It has been known that <95% adherence is associated with significant resistance to ART. In pill count method non adherence is measured by dividing number of doses missed by patient during last month or time since last follow up by total number of doses dispensed to the patient. The relationship between number of missed doses and level of adherence is mentioned below. [8]

| No. of missed doses | Level of adherence |
|---|---|
| ≤ 3 | ≥95% |
| 4 -12 | 94-80% |
| >12 | <80% |

In current study subjects are divided into 2 categories at the end of study.

1) Those who have never missed more than 3 doses in any month during the entire period **(Adherent)** and
2) Those that missed more than 3 doses on at least 1 occasion during study period **(Non adherent)**.

These categories make bases of division of study population into adherent and non adherent groups according to pill count method.

**Results:**

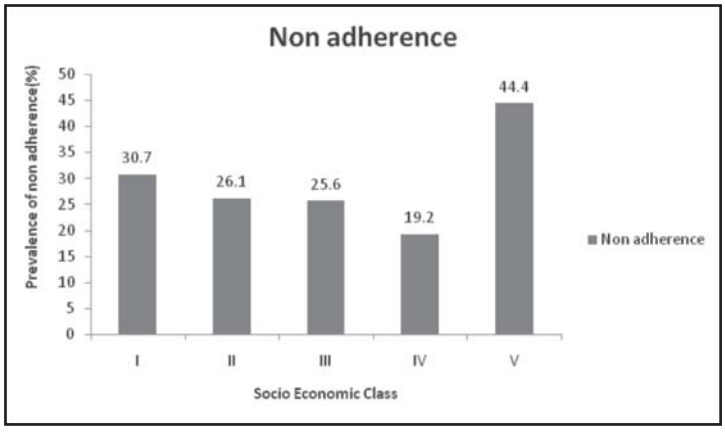
**Table 1 : Socio-demographic factors affecting level of adherence**

| Characteristics | Adherent N(%) | Non-Adherent N(%) | Total N(%) |
|---|---|---|---|
| **Age groups** | | | |
| 0-10 | 6(75.0) | 2(25.0) | 8(4.5) |
| 10-20 | 4(66.7) | 2(33.3) | 6(3.4) |
| 20-30 | 27(69.2) | 12(30.8) | 39(22.0) |
| 30-40 | 53(76.8) | 16(23.2) | 69(39.0) |
| 40-50 | 31(75.6) | 10(24.4) | 41(23.2) |
| 50-60 | 8(80.0) | 2(20.0) | 10(5.6) |
| 60-70 | 2(50.0) | 2(50.0) | 4(2.3) |
| **Gender** | | | |
| Females | 36(72.0) | 14(28.0) | 50(28.2) |
| Males | 95(74.8) | 32(25.2) | 127(71.8) |
| **Education** | | | |
| Graduate and Above | 15(68.2) | 7(31.8) | 22(12.4) |
| Secondary and Higher Secondary | 58(84.1) | 11(15.9) | 69(39.0) |
| Primary | 43(72.9) | 16(27.1) | 59(33.3) |
| Illiterate | 15(55.6) | 12(44.4) | 27(15.2) |

| | | | |
|---|---|---|---|
| **Employment status** | | | |
| Yes | 98(77.2) | 29(22.8) | 127(71.8) |
| No | 33(66.0) | 17(34.0) | 50(28.2) |
| **Marital status** | | | |
| Married | 89(76.7) | 27(23.3) | 116(65.5) |
| Single | 17(70.8) | 7(29.2) | 24(13.6) |
| Widow/widower | 12(63.2) | 7(36.8) | 19(10.7) |
| Divorced/Separated | 12(70.6) | 5(29.4) | 17(9.6) |
| Live in | 1(0.8) | 0(0) | 1(0.6) |
| **HIV Status of Partner/Parent** | | | |
| Partner Negative | 61(75.3) | 20(24.7) | 81(45.8) |
| Partner Positive | 50(74.6) | 17(25.4) | 67(37.9) |
| Both Parents Positive | 2(100.0) | 0(0.0) | 2(1.1) |
| Only Mother Positive | 0(0.0) | 1(100.0) | 1(6.0) |
| Status of Partner Unknown | 18(69.2) | 8(30.8) | 26(14.7) |
| **Total** | **131(74.0)** | **46(26.0)** | **177(100)** |

As per the table 1, highest prevalence of non-adherence (50%) was found in the age group of 60-70 years of age followed by 10-20 years of age group (33.3%). Almost similar level of non-adherence is seen among both the genders (28% in females and 25.2% in males) ($X^2$=0.14, DF=1, p>0.05). Peak of the (44.4%) non adherence was seen among illiterates. Non adherence among illiterates was 17.4%. No statistically significant difference was found between levels of non-adherence with employment. ($\chi^2$=2.32, DF=1, p>0.05). It was found that maximum non adherence was amongst widows/widowers (36.8%). ($\chi^2$=2.18, DF=4, p>0.05). As evident from the table, when HIV status of the partner was unknown, higher non adherence and less adherence were seen, compared to others.

**Figure 1: Level of non-adherence in various socioeconomic classes***




* Modified Prasad Classification

Maximum (44.4%) prevalence of non adherence was seen in SE class V, followed by class I (30.7%).

No significant relation was found between SE class and level of non adherence.

**Table 2 : Treatment related factors affecting level of adherence**

| Regimen | Adherent n (%) | Non-Adherent n (%) | Total n (%) |
|---|---|---|---|
| Stavudine+Lamivudine+Efavirenz | 5(62.5) | 3(37.5) | 8(4.5) |
| Stavudine+Lamivudine+ Nevirapine | 31(75.6) | 10(24.4) | 41(23.2) |
| Zidovudine+Lamivudine | 2(66.7) | 1(33.3) | 3(1.7) |
| Zidovudine+Lamivudine+Efavirenz | 7(53.8) | 6(46.2) | 13(7.3) |
| Zidovudine+Lamivudine+Nevirapine | 86(76.8) | 26(23.2) | 112(63.3) |
| **Previous changes in Regimen** | | | |
| Yes | 104(73.2) | 38(26.8) | 142(80.2) |
| No | 27(77.1) | 8(22.9) | 35(19.8) |
| **Duration since diagnosis** | | | |
| <6 months | 19(73.0) | 7(27.0) | 26(14.7) |
| 6-12 moths | 19(73.0) | 7(27.0) | 26(14.7) |
| 12-60 months | 71(71.7) | 28(28.2) | 99(55.9) |
| >60 months | 22(84.6) | 4(15.3) | 26(14.7) |
| **Duration since treatment** | | | |
| <6 months | 47(67.1) | 23(32.9) | 70(39.5) |
| 6-12 moths | 24(77.4) | 7(22.5) | 31(17.5) |
| 12-60 months | 59(78.7) | 16(21.3) | 75(42.4) |
| >60 months | 1(100) | 0(0) | 1(0.6) |
| **Total** | 131(74.0) | 46(26.0) | 177(100) |

Highest level of non adherence (46%) was seen among those who were on the regimen containing Zidovudin+Lamivudin+Efavirenz. Most 112(63.3%) PLHA were on regimen Zidovudin + Lamivudin + Nevirapine. Level of non adherence among them was 23.2%. There is 26.8% of non adherence among those whose ART regimen has been changed in the past, while prevalence of non adherence among those, whose ART regimen was not changed in the past is 22.9 % ($X^2$=0.22, p=0.06). Highest non adherence was seen amongst those who has been perusing treatment for less than 6 months (32.9%). (Table-2)

**Discussion :**

The present study had sample size of 200 patients of HIV, enrolled and attending ART centre, Civil Hospital, Ahmedabad. Out of 200, 177 could be followed till the end of study. This constitutes attrition of 11.5% of sample. Overall 131(74.0%) patients were completely adherent and never missed >3 doses/month during entire study period. 46(26.0%) patients had missed >3 doses/month at some point of time. They were defined as non-adherent. A study done in Pune and Delhi by Sarna A et al also found similar non adherence of 24.1%. [9] Although they followed different monitoring method for measurement of adherence. In another prospective study involving self-pill count also showed that level of non-adherence among the sample population is 21.9%. [10]

The level of non-adherence was found higher among females in the study done by Sarna A et al (18.4%). Similar finding is seen in the current study as well, in form of higher prevalence of non-adherence among females (28.4%). This can be explained by higher level of illiteracy (24.6%) among females of sample population. Illiteracy may become barrier between knowledge of importance of adherence to ART and their practices. As per the table 1, highest prevalence of non-adherence (50%) was found in the age group of 60-70 years of age followed by 10-20 years of age group (33.3%). Previous study conducted in Cuba by Carlos Aragonés BEng MS et al

showed highest non adherence amongst <25 years age group.[7]

Non adherence was found higher (34.0%) among those who were unemployed. Different result was seen in study done by Walshe L et al. Level of adherence among unemployed was higher (48.7%) than employed (33.7%). Highest level of non-adherence was among widows/wodowers (36.8%). Similar results were also noted in the study done in Sub Saharan Africa (33.3%). [11]Those whose partner or parents HIV status was unknown were more (30.8%) non adherent than who were aware. This may show their attitude of neglecting the illness and importance of knowing the status of partner. This may be reflected in their behaviour of missing doses as well.

The regimen containig "Zidovudine + Lamivudine + Efavirenz" was associated with higher level of non-adherence. Different results were found in a study conducted by Arun Kumar. [12]The mentioned study showed highest non adherence with regimen "Stavudine+Lamivudine+Efavirenz" It was observed in the current study that changes in the regimen leads to higher chances of non-adherence. Contrasting result was seen in study conducted at Cuba.[13]

**Conclusion and Recommendations :**

Current study could examine possible factors like age, gender, level of education, HIV status of partner, drug regimens, duration of treatment etc. Higher non adherence is seen among people with above mentioned characteristics. So such patients need more social support and motivation. Regular home visit can help to solve the issue among these patients. Increase in number of counseling session can also be beneficial to such patients. Daily or weekly pillboxes, timers with alarm, pagers, SMS on mobile or other devices can be used to remind patients with geriatric age group. Patients with low level of education may find conventional method of explanation about dosing, as difficult. For such patients, visual aids and audio/video information sources may be more beneficial. Apart from this, PLHA should be encouraged for education. Because of that, children living with HIV/AIDS can be also be benefited, if financial, social and mental supports are provided for education. Overall increase in education level can result in increase in adherence level.

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# Knowledge, Attitude and Practices (KAP) Regarding Breastfeeding : A Community based Cross Sectional Study from Rural Uttrakhand

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**Abstract :**

**Introduction :** By assessing the knowledge, attitude and practices of lactating mothers regarding their child's feeding, an overview can be obtained about the areas, which need modifications and hence specific intervention strategies can be made to correct the same. **Objective:** 1.To analyze and ascertain knowledge, attitude and practices of breastfeeding among lactating mothers. 2.To compare the findings with the socio-demographic variables **Method :** The present cross-sectional study was undertaken in the rural field practice area of Department of Community Medicine, Government Medical College, Haldwani during June 2013 to August 2013. 250 lactating mothers having children in the age group 0-24 months were contacted and interviewed. Analysis was done using SPSS version 20 (IBM, Chicago, USA). **Results:** Only 37.3% mothers were aware of the fact that breastfeeding should be initiated within one hour. 98.4% mothers had knowledge that mother milk is best for the baby. 88% mothers did not have knowledge about the benefit of breastfeeding. Cow milk was the most prevalent form of pre-lacteal feed while honey was second most popular amongst the interviewed subjects. Illiterate mothers practiced demand feeding more as compared to women with higher education. **Conclusion:** Breast feeding was observed to be a universal practice in the study areas. However, illiterate mothers breast fed for longer duration and follow demand feeding. We need to reinforce emphasis on starting breast feeding within one hour of birth and giving colostrum.

**Key words:** KAP study, Rural, Breastfeeding, Lactating Mothers.

## Introduction :

Breastfeeding has been accepted as the most vital intervention for reducing infant mortality and ensuring optimal growth and development of children.[1] The benefits of breastfeeding for the health and wellbeing of the mother and baby are well documented. A recent trial has shown that early initiation of breastfeeding could reduce neonatal mortality by 22%. [2]The beneficial effects of breastfeeding depend upon correct breastfeeding practices. Initiation of breastfeeding after birth is considerably delayed in India, and in most cases the valuable colostrum is discarded before putting the child to breast.[3] It is recommended that babies should be exclusively breastfed for the first six months. Exclusive breastfeeding means that no other food or drink should be given to the baby for first six months. [4]

Poor infant feeding practices directly or indirectly contribute to under nutrition, morbidity and mortality in infants. Sometimes lack of awareness and not the poverty per se may be the likely cause of faulty infant feeding practices. [5]The breastfeeding and complementary feeding practice of a community are governed by its traditions, customs, knowledge, beliefs and socio cultural practices, since these aspects vary from one to another, quantification and understanding of their relative contribution to the emergence of malnutrition becomes important.

By assessing the knowledge, attitude and practices of lactating mothers regarding their child's feeding, an overview can be obtained about the areas which need modifications and hence specific intervention strategies can be made to correct the same.

**Objective :**

The present study was planned with an objective to analyze and ascertain knowledge, attitude and practices of breastfeeding among lactating mothers. An additional objective was to compare the findings with the socio-demographic variables.

**Method :**

The present cross-sectional study was undertaken in the rural field practice area of Department of Community Medicine, Government Medical College, Haldwani, from June 2013 to August 2013. Eligibility criteria were; the mother should be lactating and having children aged less than 2 years. All the eligible study subjects were planned to include in the survey. Study subjects were selected from the rural field practice area of Government Medical College, Haldwani. It has been adopted by this tertiary medical centre for rural training of under graduate and post graduate students in community medicine and for providing health services to the villagers.

According to the records of the Anganwadi workers, there were 287 such lactating mothers with children in the age group 0-24 months among the residents of rural field practice area of Government Medical College, Haldwani. About 37 eligible mothers were either non-cooperative (refused) or could not be interviewed despite making 3 visits to contact them, thus excluded from the study. Therefore remaining 250 eligible study subjects were contacted and interviewed.

Information was collected using a structured questionnaire. It was ensured that respondents understand the meaning of questions well. It included questions on socio demographic characteristics, child breast-feeding attributes, opinion about colostrum, time of initiating breast feeding and other relevant details. The questionnaire was pilot tested on 20 women and amended for clarity with the addition of some answer options and was modified accordingly. All interviews and examinations were conducted by single person. Ethical approval was obtained prior to study. Informed consent was ensured from the study participants.

All the questionnaires were manually checked and edited for completeness and consistency and were then coded for computer entry. After compilation of collected data, analysis was done using Statistical Package for Social Sciences (SPSS), version 20 (IBM, Chicago, USA). The results were expressed as proportions. Chi-square ($\chi^2$) test was applied to test the difference across the groups and $p<0.05$ was considered statistically significant.

**Results :**

The present cross sectional study, carried out in a rural community in Uttrakhand, included a total of 250 lactating mothers having children aged less than 2 years. The study included 68.4% mothers with children in the age group >6 months and 31.6% mothers with children in the age group< 6months. 22.8% of lactating mothers were illiterate and most (98%) were housewives. The maximum number of fathers (91.2%) were literate and 38.4% of them were working in low professional jobs. 63% of the respondents belonged to joint families, 37% were from nuclear families (Table 1).

**Table 1: Demographic profile of family**

| Some Demographic & related variables | Frequency | Percentage |
|---|---|---|
| **1. Child Age ( months)** | | |
| < 6 month | 79 | 31.6 |
| >6 month | 171 | 68.4 |
| **2. sex** | | |
| Male | 131 | 52.4 |
| Female | 119 | 47.6 |
| **3. Religion** | | |
| Hindu | 208 | 83.2 |
| Muslim | 37 | 14.8 |
| Sikh | 5 | 2 |

| | | |
|---|---|---|
| **4. Caste** | | |
| General | 111 | 44.4 |
| OBC | 38 | 15.2 |
| SC | 101 | 40.4 |
| **5. Mother education** | | |
| Illiterate | 57 | 22.8 |
| Primary | 72 | 28.8 |
| High school | 56 | 22.4 |
| Intermediate | 21 | 8.4 |
| Graduate and above | 44 | 17.6 |
| **6. Father education** | | |
| Illiterate | 22 | 8.8 |
| Primary | 58 | 23.2 |
| High school | 74 | 29.6 |
| Intermediate | 43 | 17.2 |
| Graduate and above | 53 | 21.2 |
| **7. Father occupation** | | |
| Unskilled | 81 | 32.4 |
| Skill | 96 | 38.4 |
| Agriculture | 27 | 10.8 |
| Service | 46 | 18.4 |
| **8. Mother occupation** | | |
| Housewife | 245 | 98 |
| Service | 5 | 2 |

98.0% mothers had knowledge that mother milk is best for the baby. 88% mothers did not have knowledge about the benefit of breastfeeding to herself . 88.8% mothers believed that colostrum is good for the baby and 74.8% were of the opinion that pre-lacteal feed should not be given. 62.8% believed that breast feeding should be given on demand and 26.8% thought that should be given to fix time. Majority of lactating mothers thought that breastfeeding could be continued during menstruation, mother's illness and child illness. Only 37.2% mothers aware of the fact that breastfeeding should be initiated within one hour. 68.8% had fed colostrum to their last child. Half of the mothers had introduced complementary feed to the child at end of the six months (Table 2A&B)

**Table 2 (A): Child breast-feeding attributes**

| **Attribute** | **Number (%)** |
|---|---|
| **Knowledge regarding to breastfeeding** | |
| Mother milk best | 245( 98.0) |
| Other milk | 5( 2.0) |
| **Time of initiating breast feeding Knowledge** | |
| Within 1 hr of birth | 93( 37.2) |
| Between 1-4 hrs of birth | 105( 42.0) |
| Within 24 hrs of birth | 45 ( 18.0) |
| 2nd day onward | 7(2.8) |
| **Practice ( breast feeding initiation last child) (n=158)** | |
| Within 1 hr of birth | 59(37.4) |
| Between 1-4 hrs of birth | 30(18.9) |
| Within 24 hrs of birth | 33(20.9) |
| 2nd day On | 36(22.8) |
| **Opinion about colostrums Attitude** | |
| **( n=250)** | |
| Good | 222( 88.8) |
| Bad | 15(6.0) |
| Don't know | 13( 5.2) |
| **Practices of feeding colostrums to** | |
| **last child (n= 250)** | |
| Within 1 hr | 108(43.2) |
| Within 24 hrs | 38( 15.2) |
| Within 2 days | 26( 10.4) |
| No given | 78( 31.2) |
| **Attitude regarding to prelacteal feed** | |
| Not be given | 187( 74.8) |

| | |
|---|---|
| Should be given | 63( 25.2) |
| **Exclusive breast feeding for 6 months** | |
| **duration of EBF** | |
| 0-6 months | 224( 89.6) |
| >6 month | 26( 10.4 ) |
| **Frequency of breast feeding in day** | |
| 3-10 time | 229( 91.6) |
| >10 time | 21 ( 8.4 ) |
| **Frequency of night breast feeding** | |
| 1-4 time | 146( 58.4) |
| 4-9 time | 104( 41.6) |
| **Complementary feed age Knowledge** | |
| 3-6 months | 26 ( 10.4) |
| >7 months | 223( 89.6) |
| **Practice of introduction of** | |
| **complementary feed to last child** | |
| **(n=250)** | |
| 3-6 month | 115( 46.0) |
| >7 months | 135(54.0) |
| **Methods of artificial feeding** | |
| Bottle | 124( 49.6) |
| Katori | 51( 20.4) |
| Cup | 3( 1.2) |
| | |
| | |

**Table2 (B): Mothers attribute regarding to child breast-feeding**

| Attribute | Number (%) |
|---|---|
| **Duration of breast feeding** | |
| **Attitude** | |
| 6 months | 150(60.0) |
| Upto 12 months | 30( 12.0) |
| Upto 24 months | 70 ( 28.0) |
| **Practices of breast feeding last child (n=159)** | |
| 6 months | 49 ( 30.8) |
| Upto 12 months | 53 ( 33.3) |
| Upto 24 months | 57 ( 35.8) |
| **Continuation of breastfeeding during menstruation** | |
| **Attitude** | |
| Good | 243 ( 97.2) |
| Bad | 7 ( 2.8) |
| | |
| **Continuation of breastfeeding during mother illness** | |
| **Attitude** | |
| Good | 192( 76.8) |
| Bad | 58 ( 23.2) |
| **Continuation of breastfeeding during baby illness** | |
| **Attitude** | |
| Good | 236( 94.4) |
| Bad | 14( 5.6) |
| **breast feeding benefit to mother Knowledge** | |
| Known | 30( 12.0) |
| Do not know | 220( 88.0) |

Table 3 shows the relation between breast feeding and educational status of the lactating mothers. 105 (42%) of the children were put to breast 1-24 hours while 93 (37.2%) were given their first feed within one hour of birth. Interval between first feed was significantly related to the educational status of the mother. Literate mothers were more likely to feed their infants early as compared to illiterate mothers ($p<0.0001$).

**Table 3: First breast feeding initiation relation to educational status of lactating mothers**

| Educational status | First milk given | | | | |
|---|---|---|---|---|---|
| | 0-1 hrs | 1-24 Hrs | 24-48 Hrs | 48-72 Hrs | Total |
| Illiterate | 4 | 4 | 42 | 7 | 57 |
| Primary | 28 | 43 | 1 | 0 | 72 |
| High School | 27 | 27 | 2 | 0 | 56 |
| Intermediate | 12 | 9 | 0 | 0 | 21 |
| Graduate and Above | 22 | 22 | 0 | 0 | 44 |
| Total | 93 | 105 | 45 | 7 | 250 |

Chi-square=194.310,df=12,p<0.001

It was observed that 74.8% of the lactating mothers did not believe in giving pre-lacteal feeds. Cow milk which is preferred than honey was the most prevalent form while honey was second most popular form of pre-lacteal feed amongst the interviewed subjects. The relation between educational status of mothers and pre-lacteal feeds is shown in (Table 4).

**Table 4: Pre-lacteal feeds in relation to educational status of lactating mother**

| Educational status | Pre-lacteal feed | | Total |
|---|---|---|---|
| | Yes | No | |
| Illitrate | 28 | 29 | 57 |
| Primary | 5 | 67 | 72 |
| High School | 14 | 42 | 56 |
| Intermediate | 3 | 18 | 21 |
| Graduate And Above | 13 | 31 | 44 |
| Total | 63 | 187 | 250 |

Chi-square=31.805, df=4,p<0.001

It was found that educated mothers were giving less pre lacteal feed as compare to illiterate mothers and this difference was found to be statistically significant. Majority of the lactating mothers 62.8% breast fed their children on demand while 26.8% at fix time. It was observed that illiterate mothers practiced demand feeding more as compared to women with higher education (

**Table 5: Breast feeding attitude in relation to educational status of lactating mothers**

| Educational | Status when breast feeding should be given | | | Total |
|---|---|---|---|---|
| | On Demand | At Fix Time | Both | |
| Illitrate | 41 | 8 | 8 | 57 |
| Primary | 48 | 18 | 6 | 72 |
| High School | 34 | 20 | 2 | 56 |
| Intermediate | 12 | 8 | 1 | 21 |
| Graduate And Above | 22 | 13 | 9 | 44 |
| Total | 157 | 67 | 26 | 250 |

Chi-squre=17.008,df= 8, p<0.030

**Discussion :**

In the present study, 37.2% of lactating mothers had the knowledge about initiation of breast feeding within 1 hour of birth whereas 37.3% practiced it. 88.8% of mothers had good opinion about colostrums. Similar findings were reported by Durge et al 1996 that 83.59% had fed colostrums. [6] Subbaiah and Nanthini, in their study conducted on 100 postnatal mother's report that 91 of the population knew that they should feed the baby with colostrums but only 50 of the population knew the reason for feeding colostrums. [7] This was similar to the study of Das and Ahmed, who reported that most of the Bangladeshi rural mothers did not have correct knowledge about exclusive breastfeeding. [8]

WHO recommends 6 months of exclusive breastfeeding for infants but, in our study only 38% of the mothers knew that exclusive breastfeeding should be given for 6 months. Studies show that the mean duration of exclusive breast-feeding is estimated to be more than six months in many states in India, ranging from 6.7 months in Tamil Nadu to 10.8 months in Andhra Pradesh. Poverty and ignorance are the main reasons for this practice, which is one of the major causes of malnutrition among infants. [9]

In our study it was found that 42.0% and 37.2 % lactating mothers had knowledge about early initiation breast feeding (within one hour and 1-4 hours respectively) while various Indian studies have noted higher knowledge about early initiation of breastfeeding ranging from 87- 92%. [10-13]

It was observed in our study that 25.2% of the lactating mothers were giving pre lacteal feed. The findings of the present study were similar with the findings of Purnima Bhale and Shikhar Jain (1999) [14] S. Kishore and B. S. Garg (1999) [15] and V. R. Parmar et al (2000) [16], who found prevalence of pre lacteal feeding as 43.96%, 45% and 42% respectively. It was observed that majority 62.8% lactating mothers fed their babies on demand, this was low in comparison to S. K. Bandopadhyay et al (2000) [17] where 84.5% mothers offered demand feeding to the babies.

**Conclusion :**

Breast feeding was observed to be a universal practice in the study areas and accepted to be the healthiest food for infants. Literate and illiterate lactating mothers do believe in giving colostrum and literate mothers are less likely to give pre-lacteal feed. However, illiterate mothers breast fed for longer duration and follow demand feeding. Thus we need to reinforce the advantage of breast feeding to both mothers and babies with emphasis on starting breast feeding within one hour of birth and giving colostrum.

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# Knowledge, Attitude and Practices among Mothers of Pre-school Children Regarding Vitamin A Supplementation at Field Practice Area of GCS Medical College, Ahmedabad.

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**Abstract :**

**Introduction :** Vitamin A deficiency is one of the most important causes of preventable childhood blindness and is a major contributor to morbidity and mortality from infections, especially in children and pregnant women, affecting the poorest segments of populations, particularly those in low and middle income countries. **Objective:** To determine the knowledge, attitude and practices of mothers of pre-school children regarding Vitamin A supplementation. **Method:** A Cross sectional study was carried out in the urban field practice area of GCS Medical College, Ahmedabad during October 2015 to November 2015. Total 250 mothers of pre-school children (1-5 years of age)were interviewed through house to house survey using a pretested questionnaire. **Results:** Mean age of mothers was 27.8 $\pm$ 4.4 years. 8.4% of mothers were illiterate. 92% were housewives and 37.6% belong to low socio economic status. 66.4% belong to joint family. 98.4% children had ever received Vitamin A Supplementation and out of them 71.5% had received Vitamin A supplementation from Anganwadi Centre followed by Urban Health Centre (17.9%). Only 4.4% mothers answered night blindness as disease caused by vitamin A deficiency followed by vision problem (4.4%). 36.6% mothers had knowledge that Green leafy vegetables are good source of vitamin A followed by Banana (35.7%) and Papaya (24.4%). 8.0% mothers had received information of Vitamin A rich food. **Conclusion:** Nutrition education session for mothers should be arranged; it should address knowledge of VA-rich food & vitamin A supplementation of pre-school children.

**Key Words:** Vitamin A supplementation, Pre-school children, Night blindness

## Introduction :

Pre-school children represent about 9.7 percentage of the general population in India. The pre-school age mortality in India is as high as 2.3 per cent of all deaths. This high mortality, which is largely due to infection and malnutrition, is characteristic of this age group in underprivileged areas. Their development is in the interest of the total national development; therefore, they need special attention. Unfortunately, pre-school age children are comparatively less attended to. At least 5 per cent of the pre-school age children belonging to poor socio-economic groups show signs of vitamin A deficiency.[1]

An estimated 5.7%children in India suffer from eye sign of Vitamin A deficiency (VAD). Vitamin A deficiency is in fact, the single most frequent cause of blindness among pre-school children in developing countries.[1]Vitamin A schedule recommended under the National Programme for prophylaxis against Blindness in children caused due to vitamin A deficiency integrated with RCH programme is 1 lakh IU for 6-11 months old baby as a first dose then from 1-5 years 2 lakh IU per 6 months. A total of 9 doses of Vitamin A are given (Government of India, 2006). Children age 12 – 35 months who received a Vitamin A dose in last 6 months is 21% only. (NHFS-3)[2]

Vitamin A is an essential nutrient needed in small amounts for the normal functioning of the visual system, and maintenance of cell function for growth, epithelial integrity, red blood cell production, immunity and reproduction.

Vitamin A deficiency is one of the most important causes of preventable childhood blindness and is a major contributor to morbidity and mortality from infections, especially in children and pregnant women, affecting the poorest segments of

populations, particularly those in low and middle income countries. The primary cause of vitamin A deficiency is lack of an adequate intake of vitamin A, and may be exacerbated by high rates of infection, especially diarrhoea and measles. Its consequence is most apparent during stages of life of high nutritional demand (e.g. early childhood, pregnancy and lactation).[3]

Nutritional blindness is one of the serious public health problems. Younger the child, more serious is the disorder because a young child is not having sufficient vitamin A reserve in the body unlike adults and it often associated with Protein Energy Malnutrition (PEM). Thus, a young child is always at risk of Vitamin A deficiency. Nearly 70000 children below 3 years are becoming permanently blind only due to Vitamin A deficiency every year in India.[4]

Xerophthalmia is the most specific VAD Disorder, and is the leading preventable cause of blindness in children throughout the world.[5] Pre-existing VAD appears to worsen infection[6] and vitamin A supplementation has been shown to reduce the risk of death in 6–59 month old children by about 23–30%.[7,8]

Various types of community interventions can reduce VAD in affected populations that are improving the availability and intake of vitamin A through dietary diversification, by increasing the dietary intake of vitamin A is through fortification of a staple food or condiment with vitamin A[9] & thirdly, the most widely practiced approach to control VAD in most high risk countries is the periodic administration of high-potency supplements, containing 200000 IUof vitamin A, to pre-school age children (<5 years), with half of this dose given to infants aged 6–11 months of age.[10] Worldwide, between 1.3 and 2.5 million out of a total of 7.8 million deaths among infants and preschool-age children (late infancy up to age 4 years) could be prevented each year by improving vitamin A nutrition.[11]

In order to improve the vitamin A supplementation coverage of the under five children, government of India has linked Vitamin A supplementation to Universal Immunization Programme (UIP) and Integrated Child Development Services (ICDS).[12]

**Objective :**

- To determine the knowledge, attitude and practices of mothers of pre-school children regarding vitamin A supplementation

**Method :**

A Community based cross sectional study was conducted among 250 mothers of pre-school children (1 to 5 years of age) in urban field practice area of GCS Medical College; Ahmedabad after obtaining ethical approval from institutional ethical committee. After taking informed consent, interview of mothers of pre-school children were taken by trained authors through house to house survey starting from 1st house, till desired sample size achieved using pre-tested & semi structured questionnaire during October to November 2015.(Total population covered by urban health training centre, Community Medicine Department, GCS Medical College, Ahmedabad is around 5000. Pre-school children represent about 9.7 percentage of the general population in India, as per this total pre-school children may be 500. So total 250 preschool children were taken as study sample (50% of the preschool children were taken as a study sample). Questionnaire contains socio-demographic information of mother, children age, birth order, total vitamin A supplementation dose taken, Vitamin A rich food knowledge, knowledge about national vitamin A prophylaxis programme etc. Vitamin A supplementation practice was confirmed after seeing Mamta card of mother or Immunization card of child. Data entry was done in MS Excel and Analysis was done.

**Results :**

Table 1 shows mean age of mother was 27.8 $\pm$ 4.4 years. Minimum age of study sample was 20 years and maximum age of mother was 42. Total 99.6% mothers were Hindu and 72.8% had taken secondary education or higher. Most of the mothers were housewives (92%) and 37.4% were in class IV & V. Total 66% mothers belong to joint family. 98.4% children had ever received vitamin A supplementation dose.

**Table 1: Socio-demographic profile of mothers (n=250)**

| Sr. No. | Particular (n=250) | Frequency (%) | Percentage |
|---|---|---|---|
| **1** | **Age group (in years)** | | |
| | 20-30 | 199 | 79.6 |
| | 30-40 | 50 | 20 |
| | 40-50 | 01 | 0.4 |
| **2.** | **Religion** | | |
| | Hindu | 249 | 99.6 |
| | Muslim | 01 | 0.4 |
| **3** | **Education level of mothers** | | |
| | Illiterate | 21 | 8.4 |
| | Primary Education | 47 | 18.8 |
| | Secondary Education | 126 | 50.4 |
| | Higher Secondary | 37 | 14.8 |
| | Graduation / Post-graduation | 19 | 7.6 |
| **4** | **Occupation of Mothers** | | |
| | Housewife | 230 | 92 |
| | Business | 13 | 5.2 |
| | Service | 06 | 2.4 |
| | Laborer | 01 | 0.4 |
| **5.** | **Socio-economic status (Modified Prasad Classification)** | | |
| | I | 12 | 4.8 |
| | II | 39 | 15.6 |
| | III | 105 | 42 |
| | IV | 86 | 34.4 |
| | V | 8 | 3.2 |

In table 2,52.4% of the children below 18 months of age had received two doses of vitamin A supplement as per National vitamin A prophylactic programme while 1.8% children above 18 months of age had not received any dose of vitamin A Supplement in children age group 18 months to 5 years of age. 52.4% children had taken two or more doses of vitamin A supplementation in children age group 18 months to 5 years of age.

**Table 2: Vitamin A supplementation according to age**

| Age of child (in months) | Vitamin A Supplementation received | Frequency (%) |
|---|---|---|
| 12 to 18 months (n=21) | Received only two doses of Vitamin A | 11 (52.4%) |
| 18 months to 60 months (n=229) | Received only one dose of Vitamin A | 105(45.8%) |
| | Received at least two or more doses of vitamin A | 120 (52.4%) |

Table 3 shows 71.5% children had taken dose of vitamin A supplements from Anganwadi centre followed Urban Health Centre (17.9%).

**Table 3: Place of vitamin A supplementation received**

| Place | Frequency | Percentage (%) |
|---|---|---|
| Anganwadi | 176 | 71.5 |
| Urban Health Centre | 44 | 17.9 |
| Government Hospital | 08 | 3.3 |
| Private Hospital | 08 | 3.3 |
| Trust Hospital | 06 | 2.4 |
| CHC/PHC | 02 | 0.8 |
| Municipal Hospital | 02 | 0.8 |

Figure 1 show only 11 (4.4%) mothers had knowledge that night blindness is caused by vitamin A deficiency while few mothers answered wrong like polio, fever, skin disease, paralysis, measles etc. developed due to vitamin A deficiency.52% mother had knowledge of one or more food rich in vitamin A.

**Figure 1: Knowledge of mothers regarding diseases due to Vitamin A deficiency**

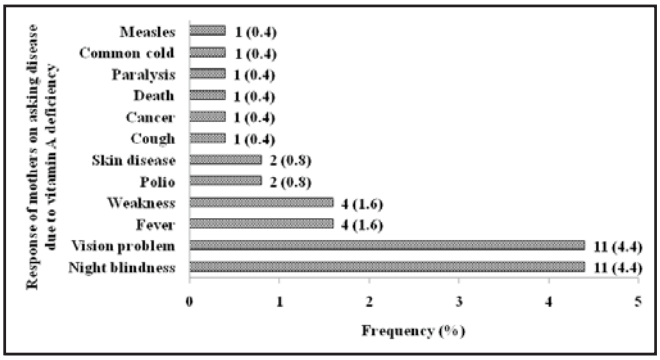


**Table 4: Received any information regarding Vitamin A Supplementation& vitamin A rich food**

| Received any information | Vitamin A Supplementation information | | Information regarding vitamin A rich food | |
|---|---|---|---|---|
| | Frequency | Percentage (%) | Frequency | Percentage (%) |
| No | 226 | 90.4 | 230 | 92 |
| Yes | 23 | 9.2 | 20 | 08 |
| Not remembered | 01 | 0.4 | 00 | 00 |

Table 4 shows only 23 (9.2%) mothers had received information regarding vitamin A supplementation dose and 20 (8%) mothers had received information regarding sources/food rich in vitamin A.

In table 5, from Anganwadi centre, 18 (78.3%) mothers received information regarding vitamin A supplementation while 16 (80%) mothers received information regarding food rich in vitamin A.

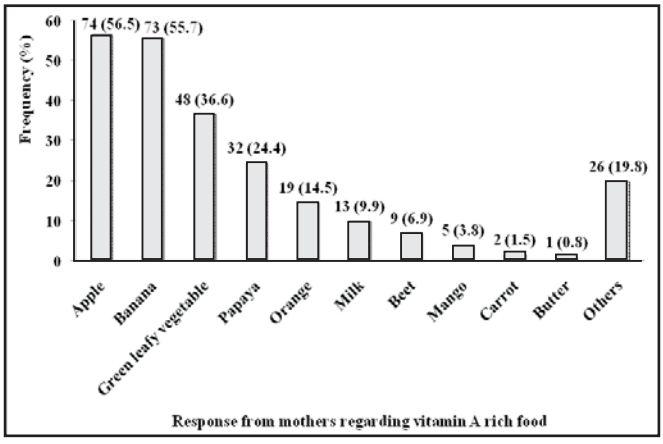
**Table 5: Source of information regarding Vitamin A Supplementation***

| Source | Received information regarding Vitamin A Supplementation | | Received information of Vitamin A rich food | |
|---|---|---|---|---|
| | Frequency (n=23) | Percentage (%) | Frequency (n=20) | Percentage (%) |
| Anganwadi | 18 | 78.3 | 16 | 80 |
| Health worker/Vaccinator | 04 | 17.4 | 01 | 05 |
| Doctor | 02 | 8.7 | 03 | 15 |

*Multiple answers

In figure 2, 56.5% mothers answered apple a source of vitamin A followed by banana (55.7%), Green leafy vegetables (36.6%), Papaya (24.4). Others include rice, dal, roti, egg, pulses, almond, custard apple, pomegranate, breast milk, chikoo, and fish.

**Figure 2: Knowledge of various food sources of Vitamin A (n=131)**




In the present study, 35.2% mothers had knowledge regarding National Vitamin A Prophylaxis Programme. 54.4% mother believed vitamin A deficiency disorder is curable & 58% mothers believed vitamin A deficiency disorder are preventable.

Table 6 shows association of knowledge on vitamin A rich foods, curability & prevention of vitamin A deficiency disorder with mother's education level. It is significantly associated with education level of mothers. (p value < 0.05)

**Table 6: Association of mother's education levels with knowledge on vitamin A rich foods, Vitamin A deficiency disorder curable & Preventable**

| Variable with categories | Mother's Education | | | | | Chi square test (p value) |
|---|---|---|---|---|---|---|
| | Illiterate | Primary | Secondary | Higher secondary | Graduation / Post graduation | |
| knowledge on vitamin A rich foods | 8 | 34 | 49 | 23 | 16 | 27.52 (< 0.0001) |
| Vitamin A deficiency disorder curable | 13 | 33 | 53 | 24 | 14 | 17.44 (0.0016) |
| Vitamin A deficiency disorder preventable | 12 | 37 | 57 | 25 | 15 | 21.57 (0.002) |

**Discussion :**

Present study showed mean age of mother was 27.8 ± 4.4 years. In the study by Shanker Mattaet al, majority of women, 308 (61.6%) interviewed were in the age group of 16-25 years. Regarding the educational status 111(22.7%) women were illiterate followed by 118 (24.1%) women, who were educated till 5/6th standard. Regarding the occupation majority of women were housewives or daily wagers/labourers.[13]

In the previous study conducted by Rozina Khali et al, The mean age of mothers was 29.28 years (SD ± 5.34), minimum age was 19 and maximum age was 45 years. About 93% of mothers were housewives and only 7% were working ladies. 70% were poor but 7% belonged to very low socio economic status. Only 12% of women got education more than 10 years schooling.[14]while present study showed most of the mothers were housewives (92%) and 37.4% were in class IV & V.

Azizur Rahmanet al. found nearly forty three percent mothers were aged 28-32 years and only about eleven per cent mothers were less than 23 years. More than seventy one per cent women were Hindu.Likewise fifty one per cent and twenty eight percent women had higher secondary level and secondary level education respectively.

Two third of mothers were lived in nuclear family, and more than half of the respondents were employed with forty three percent as aservice holder. Sixty five percent of mothers had a monthly family income of more than 10,000 rupees.

Besides this, more than half of the mothers got information from health workers while a quarter of them got information via Radio/TV. Likewise sixty four percent mothers got information from health campaign in their community and ninety eight percent got information from families and friends.

Ninety one percent mothers knew vitamin A deficiency disordered can be cured, whereas more than two third of mothers didn't agree that it can be preventable.[15]

While in present study 54.4% mother believed vitamin A deficiency disorder is curable & 58% mothers believed vitamin A deficiency disorder are preventable. In the previous study conducted by Rozina Khaliet al, 33% respondents had no information about Vitamin-A. 27% had source of information from TV and 15% had the information from LHW / vaccinator. Vitamin A knowledge was more among mothers with educational level.[14]

In the present study it was found that only 4.4% mothers had knowledge that night blindness is caused by vitamin A deficiency while study conducted by N. Arlappaet al, only 12% of the mothers reportedly received health and nutrition education on VAD. About 21% of mothers of pre-school children were aware of night blindness, while only 12% of them attributed it to vitamin A deficiency.[16]

Shanker Mattaet al. found41.8% women had no idea about the food stuffs rich in vitamin A, 22.6% women had heard of vitamin A programme. [13] WhileIn the present study, 35.2% mothers had knowledge regarding National Vitamin A Prophylaxis Programme.

Although the supplementation of a massive dose of vitamin A to pre-school childrenunder the national programme for prevention of nutritional blindness has been in operation in India for the last three decades, the coverage of children for the stipulated biannual massive dose of vitamin A was only 33%. However, coverage was relatively higher compared to 23% (NNMB 2003). [17]and 30% reported in India (IIPS (International IIPS 1998–1999)[18]previously reported in India and 25.6% reported by a Nigerian study (Maziya-Dixon et al. 2006).[19]

According to the National Family Health Survey (NFHS) 3 (2005-2006) only 18 percent of children aged 6-59 months had received at least one dose of Vitamin A in the last six months. The District level household survey (DLHS 3) (2007-2008) reports that only 19 percentof children aged 12-35 months had received 3-5doses of Vitamin A [20] while in present study52.4% of the children below 18 months of age had received two doses of vitamin A supplement and1.8% children above 18 months of age had not received any single dose of vitamin A Supplement in children age group 18 months to 5 years of age.

In the present study, from Anganwadi centre, 78.3% mothers received information regarding vitamin A supplementation and 80% mothers received information regarding food rich in vitamin A while in the study by Njue MW et al, ninety four percent of the respondents reported having heard about vitamin A, major source of information being the health worker (82%). While 58% of the respondents were aware that the recommended schedule for Vitamin A Supplementation for children is every 6 months. [21]

According to National Nutrition Monitoring Bureau (NNMB), about 41% of the mothers of 1-5 years preschool children were aware of night blindness. About 30% of index children reportedly received one or more doses of vitamin A during the previous one year, while about 25% received two doses. [22] While in present study it was found that 52.2% children had taken two or more doses of vitamin A supplementation in children age group 18 months to 5 years of age. From this study it was clear that majority of women have no idea about food rich in vitamin A, vitamin A supplementation & this is the reason for quite apprehension.

**Conclusion :**

Knowledge of vitamin A supplementation needs to be addressed through nutritional education session to increase knowledge regarding Vitamin A supplements and also knowledge of vitamin A rich food among mothers of pre-school children.

**Recommendations :**

There is a need of health education among mothers of pre-school children to improve vitamin A supplements utilization. Health workers, Anganwadi workers and Doctor should be encouraged in motivating people and communities to increase knowledge for vitamin A supplementation.

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# A Study on Knowledge, Attitude & Practice Regarding Mosquito Borne Diseases in an Urban Area of Bhavnagar

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**Abstract :**

**Introduction:** India being a populous country with many health issues wherein Mosquito Borne Diseases (MBDs) are also a health threatening condition including Gujarat. **Objective:** To study Knowledge, Attitude & Practice Regarding Mosquito Borne Diseases in an Urban Area of Bhavnagar, Gujarat. **Method:** A community based, cross sectional study was carried out during April-June 2014 in field practice area of Urban Health Training Centre (UHTC), facilitated by Community Medicine Department of Government Medical College & Sir Takhatsinhji Hospital, Bhavnagar, with sample size of 135. One adult respondent from each selected households were selected randomly & after taking verbal consent, the respondent was interviewed using a semi-structured questionnaire. **Results:** There was good knowledge of MBDs as majority (88.1%) respondents were aware about MBDs & 3/4$^{th}$ (76.3 %) were aware about preventive measures against MBDs. In the present study, 68.1% fever cases were found of which 88% consulted government doctor for treatment. Most of (94.8%) respondents were using personal protective measures. **Conclusions:** Knowledge regarding MBDs was good & majority of the study population were practicing preventive measures at individual level as well as at community level.

**Key words:** Knowledge Attitude Practice, MBDs, Urban area of Bhavnagar

## Introduction :

Mosquito Borne Diseases (MBDs) are major health problem in India & growing urban problems because of unplanned urbanization, industrialization & excessive population growth coupled with rural to urban migration. Gujarat is also one of the endemic states of malaria & other mosquito borne diseases. Anopheles species bites transmit malaria; Aedes transmits dengue, chicken guinea, yellow fever etc. Culex and Anopheles both transmit lymphatic Filariasis. [1] Government of India is working for controlling transmission of vector borne diseases. Government has launched National Malaria Control Program in 1952 which was renamed as National Vector Borne Disease Control Program in 2003 which is one of the most comprehensive and multifaceted public health activity including prevention & control of mosquito borne diseases. [2]

Environmental control, mainly source reduction, is potentially the ideal method for controlling mosquito breeding. It requires public motivation through health education & usually legislation & law enforcement to encourage community participation. Along with environmental control, personal protective measures such as mosquito nets, screening, repellents, anti-mosquito coils & vaporizers are also equally important to protect one against mosquito bites. For this, Government is also providing Long Lasting Insecticides Treated Bed Nets (LLITNs) for community. Hence Community participation is essential for the prevention & control of an outbreak of mosquito borne disease. [3,4] For developing a suitable & effective health education strategy, it is inevitable to understand the level of knowledge of the community, their attitude & practices regarding mosquito borne diseases. With this background, it was decided to carry out this study in the urban locality of Bhavnagar city.

Hence, present study was undertaken to assess Knowledge, Attitude & Practice Regarding Mosquito

Borne Diseases in an urban area of Bhavnagar, Gujarat.

**Method :**

A community based, cross sectional study was carried out in a field practice area of Urban Health Training Centre (UHTC), which is facilitated by Community Medicine Department of Government Medical College and Sir Takhtasinji Hospital, Bhavnagar, during April – June 2014. With assumption of 50% knowledge regarding MBDs & 10% absolute error & applying it with $4pq/L^2$, sample size comes as 100. Urban field practice area of UHTC is having 1350 total households, so every $10^{th}$ household was selected by systematic random sampling, hence 135 household were selected. One adult respondent from each selected households were selected randomly & after taking verbal consent, the respondent was interviewed using a semi-structured questionnaire. The respondents from the selected households, if not willing to give information, were counseled & if still not ready to participate, immediate next household was selected for the study. The information was collected regarding awareness of mosquito borne diseases, the diseases spread by them, their breeding places, signs and symptoms of mosquito borne diseases, treatment seeking behaviour & prevention & control measures used by them.

**Data Analysis :** Data entry and data analysis was done in Microsoft Excel 2007.

**Results :**

Present study is based upon responses received from 135 respondents. Among respondents, maximum respondents (55.6%) were from 26-45 years; 54.8% were male & 45.2% females. Most of the participants (88.9%) were educated. Maximum respondents (31.1%) were engaged in labour work. Most (94.14%) of the respondents were from lower socioeconomic class. [Table 1]

**Table 1: Sociodemographic characteristics (N=135)**

| Sociodemographic Characteristics | Frequency | % |
|---|---|---|
| **Age (yrs)** | | |
| 18-25 | 32 | 23.7 |
| 26-35 | 41 | 30.4 |
| 36-45 | 34 | 25.2 |
| 46-55 | 18 | 13.3 |
| >55 | 10 | 07.4 |
| **Gender** | | |
| Male | 74 | 54.8 |
| Female | 61 | 45.2 |
| **Education** | | |
| Illiterate | 15 | 11.1 |
| Primary | 29 | 21.5 |
| Secondary | 28 | 20.7 |
| Higher secondary | 47 | 34.8 |
| Graduation | 12 | 08.9 |
| Post graduation | 04 | 03.0 |
| **Occupation** | | |
| Housewife | 15 | 11.1 |
| Labourer | 42 | 31.1 |
| Shop owner | 19 | 14.1 |
| Student | 20 | 14.8 |
| Other | 03 | 02.2 |
| **Socio-economic class** | | |
| (Class I) Upper | 00 | 0 |
| (Class II) Upper middle | 08 | 05.9 |
| (Class III) Lower middle | 27 | 20.0 |
| (Class IV) Upper lower | 61 | 45.2 |
| (Class V) Lower | 39 | 28.9 |

Almost 88.1% respondents were aware about MBDs. Regarding diseases transmitted by mosquito, 40.3% answered malaria & dengue, 33.6% interviewees mentioned malaria, 13.4% mentioned dengue & 12.6% mentioned Chikungunya. Major source of information was newspaper (73.9%). However, none of them knew that filariasis, dengue and Japanese encephalitis are related with mosquito. Most of the respondents (55.5%) answered that MBDs transmitted by mosquito bite during night

time. A question was asked regarding the breeding places of mosquitoes, more than half (58.8%) responded replied drains or polluted water, while 27.7% of people replied clean water collections while only some (13.5%) replied garbage or green plants. It was observed that 71.9% respondents had mosquito breeding places in the vicinity. [Table 2]

**Table 2: Awareness about mosquito borne diseases**

| **Aware of mosquito borne disease (N=135)** | **Frequency** | **%** |
|---|---|---|
| Yes | 119 | 88.1 |
| No | 16 | 11.9 |
| **Diseases transmitted by it (n = 119)** | | |
| Malaria | 40 | 33.6 |
| Dengue | 16 | 13.4 |
| Malaria & Dengue | 48 | 40.3 |
| Chikungunya | 15 | 12.6 |
| **Sources of information (n=119)** | | |
| Newspaper | 88 | 73.9 |
| Radio | 02 | 01.7 |
| TV | 29 | 24.4 |
| **Time of bite (n=119)** | | |
| Day | 15 | 11.1 |
| Night | 75 | 55.5 |
| Night & day | 29 | 21.5 |
| **Breeding places of mosquito (n=119)** | | |
| Clean water collection | 33 | 27.7 |
| Drain & polluted water | 70 | 58.8 |
| Garbage/Green plant | 16 | 13.5 |
| **Breeding place in vicinity (n=135)** | | |
| Yes | 97 | 71.9 |
| No | 38 | 28.1 |

In the present study, majority (76.3 %) were aware about preventive measures against MBDs of which majority (68%) replied keeping surrounding clean & proper drainage will help in reducing mosquito breeding. Most of the respondents (88.9%) knew government measures. However respondents were not satisfied with the govt. measures as they mentioned they are not enough to reduce mosquito breeding. [Table 3]

**Table 3: Awareness about preventive measures against mosquito borne diseases**

| **Aware about preventive measures** | **Frequency** | **%** |
|---|---|---|
| Yes | 103 | 76.3 |
| No | 032 | 23.7 |
| **If yes what preventive measures? (n=103)** | | |
| Keeping surrounding clean & proper drainage | 68 | 66.0 |
| Spraying chemicals on water & keeping the surrounding clean | 35 | 34.0 |
| **Aware about the government measures (n=135)** | | |
| Yes | 120 | 88.9 |
| No | 015 | 11.1 |
| **If, yes , what measures (n=120)** | | |
| Chemical spraying & fogging | 41 | 34.2 |
| Cleaning of garbage & chemical spraying | 41 | 34.2 |
| Regular cleaning of drainage | 38 | 31.6 |
| **Are Government measures enough? (n=120)** | | |
| Yes | 34 | 28.3 |
| No | 86 | 71.7 |

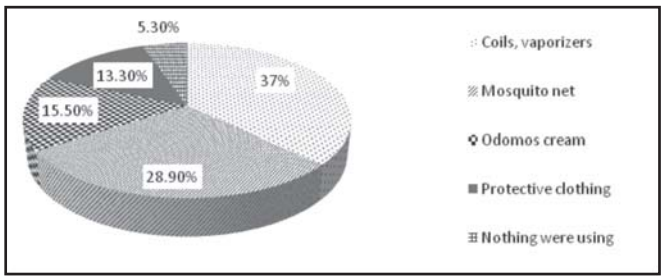
On inquiry about fever in last fifteen days in family, 68.1% fever cases were found. Majority of them (88.0%) consulted doctor & they preferred to visit government doctor for treatment. [Table 4]

**Table 4: Attitude about mosquito borne diseases**

| **Signs and symptoms of mosquito born disease in last 15 days(n=135)** | **Frequency** | |
|---|---|---|
| Fever alone | 40 | 29.6 |
| Fever with chills & rigors | 52 | 38.5 |
| No signs and symptoms | 43 | 31.8 |
| **Taken treatment for above problem (n=92)** | | |
| Yes | 81 | 88.0 |
| No | 11 | 12.0 |
| **If yes, from where (n=81)** | | |
| Govt. hospital | 43 | 53.1 |
| Private hospital | 24 | 29.6 |
| Home remedy | 14 | 17.3 |

The people were questioned about personal protective measures being taken by them. In the present study almost all (94.7%) respondents were using personal protective measures. Only 5.3% respondents were not taking any preventive measures. Among users, most (52.5%) of the respondents were using repellents in various forms like mosquito coils, creams and vapours for prevention against mosquito bites. 28.9% people were using mosquito bed net & 13.3% mentioned use of protective cloths. [Graph 1]

**Graph 1: Use of personal protective measures toward mosquito borne diseases**




**Discussion :**

The present study showed better awareness amongst the population (88.1%) probably due to good IEC activities in the state. There was good knowledge about correct mosquito breeding places among 86.5% respondents which shows the impact of effective IEC by government. But still 13.5% of study subjects consider garbage as the breeding place for mosquito. In a study by Sharma SK et al [5] in Madhya Pradesh found that majority of their study subjects did not have knowledge about mosquito breeding places. A study in Karnataka [6] found 55% respondents having correct knowledge regarding breeding sites of mosquitoes which was low as compared to our study. Knowledge of preventive measures was also good among study population in this study.

In the present study, 40.3% respondents had knowledge that mosquito bite causes malaria & dengue, 33.6% interviewees mentioned malaria, 13.4% mentioned dengue & 12.6% mentioned Chikungunya. Surendren SN [7] in their study in Srilanka found that 71% of study participants were able to name at least one disease transmitted by mosquitoes.

In the present study it was found that 94.7% of study participants were using one or other personal protective measures against mosquito bites. In the present study, bed net was used by only 28.9% of study subjects but none of the study subjects were using insecticide treated bed net (ITN). The awareness about use of ITN was found poor in the study subjects. Yerpude PN et al [8] in their study in urban slum of South India found that 90% of study participants were using one or other personal protective measures against mosquito bite & they were found to use multiple methods at the same time. In them, most commonly used method was the mosquito coil (52.20%) followed by using bed net (33.14 %).

**Conclusion :**

Most of the people in the study were aware of "malaria & dengue is caused by mosquito bite". However they were not aware of other mosquito borne diseases. Majority were using preventive measures to protect themselves from mosquito bite but the use of insecticide treated bed nets was found very low. In this study, more than half of the people preferred government facility in case of sickness.

**Recommendations :**

Knowledge regarding malaria & dengue transmission was good while knowledge regarding other mosquito borne diseases was poor. The people should be made aware that mosquito bite causes other diseases also. Insecticide treated bed-net is a good weapon to fight against mosquito borne disease & strong social or commercial marketing of these products should be done.

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# A Study of Road Traffic Accident (RTA) Deaths in a Teaching Hospital in Ahmedabad from January 2014 to June 2014 classified according to ICD-10

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**Abstract :**

**Introduction :** Global status report on road safety 2013 indicates that worldwide the total number of road traffic deaths remains unacceptably high at 1.24 million per year. Only 28 covering 7% of the world's population have comprehensive road safety laws. Road traffic injuries are the sixth leading cause of death in India with greater share of hospitalization, death, disabilities, and socio-economic losses in the young and middle-aged population. **Objectives :** 1. To study the demographic profile of deaths 2. To study the distribution of deaths in road traffic accidents according to mode of transport and victim's role 3. To identify the underlying cause of death of the deceased (according to ICD-10). **Method :** Retrospective record based study was carried out at V.S.General Hospital of Ahmadabad. A total of 139 RTA deaths studied from autopsy records section in the period 1st January 2014 to 31st June 2014. **Results :** Maximum mortality in males 117(84.2%) as compared to females 22(15.8%). Highest number of deaths occurred in the 21-50 years age group 87(62.6%). Pedestrians (V01 to V09) and drivers of two wheelers (V20 to V29) were the maximum affected victim (30.2% and 46% respectively). 52% of deaths due to head injury and head injury + complications. **Conclusion :** There is need for better and effective policy on road safety, constructing road network, ensuring proper scrutiny of individuals before issuing their driving license, educating the public on road safety.

**Key words :** Road Traffic Accidents, Pedestrians, Two wheeler

## Introduction :

Global status report on road safety 2013 indicates that worldwide the total number of road traffic death remains unacceptably high at 1.24 million per year. Only 28 countries covering 7% of the world's population have comprehensive road safety laws on five key risk factors; 1. Drinking and Driving, 2. Speeding, 3.Failing to use Helmet, 4. Seat Belts, 5. Child Restraints. Over 3400 people die on the world's road every day and tens of millions are injured or disabled every year.[1]

In India, the motor vehicle population is growing at a faster rate than economic and population growth. According to World Health Organization, road traffic injuries are the sixth leading cause of death in India with greater share of hospitalization, deaths, disabilities and socio-economic losses in the young and middle aged population.[2]

Road traffic injuries also place huge burden on the health sector in terms of pre hospital, actual care, and rehabilitation. [3] During the year 2011, a total 4.43 lakh road accidents were reported and the rate of death per 1000 vehicles was 1.2.The rate of accident deaths per 1000 vehicles was highest in Bihar and Sikkim at 1.6, followed by West Bengal at 1.5. [4] In 2007, 1.14 lakh people in India lost their lives in road mischief that is significantly higher than road death figures in China. [5] In Ahmadabad, Death due to road accident is a major concern and the city has reported 21% rise in number of fatal accident in the first four months in 2014, as compared to the last year. Ahmadabad is among the top five cities in India having the highest per capita vehicles coupled with issue such as inadequate infrastructure, the city also faces the problem of not so good traffic sense of people.[6]

The pattern of injuries are dependent on mechanical forces like shearing, strain and

biophysical motion that occurring during accidents. Road traffic accident is the third major preventable cause of death.[7]

**Objectives :**

1) To study the demographic profile of deaths due to RTA
2) To study the distribution of death of persons in road traffic accidents according to mode of transport and victim's role.
3) To identify the Underlying Cause of Death of the deceased (according to ICD-10).

**Method :**

This study was conducted in V. S. General Hospital of Ahmedabad. The study includes all deaths reported for 6-months period, recorded from 1st January 2014 to 31st June 2014. After due ethical and institutional permission, information related to deaths, due to road traffic accidents was collected from the autopsy records of the department of the institute. Confidentiality of data is maintained.

**Study Design :** Retrospective record based study

**Sampling Method :** All deaths registered during 6 months period in the institute.

Case records from the "Medical Records Section" of the institute were studied for each of the autopsy reports of road traffic accidents death. Necessary socio-demographic details in terms of age and sex, mode of transport, victim's role, and circumstances of the occurrence of the accident were sought. After corroborating both records and underlying cause of death was identified. The analysis is done by appropriate software and the results were interpreted in terms of mean and standard deviation.

**Sample size :** A Total of 139 RTA deaths were studied from autopsy records section in the period 1st January 2014 to 31st June 2014. All the Road Traffic Accident deaths coming in the particular specified Time period were taken and all the 139 deaths were studied and analyzed for the different variable.

**Results :**

Out of total 139 deaths, 117(84.17%) victims were male and the rest 22(15.83%) were female. Highest number of victims were in the age group 21-30 years 38(27.3%) followed by 31-40 years 27(19.4%) in both the sex groups. A total of 107 (77%) of all deaths took place in the age group 21 to 60 years, i.e. economically most productive age group; and nearly similar proportion (75.2%) deaths were in males. The proportion in females in the same age group constituted 18 (81.8%) of all female deaths. Almost 50% cases of RTA occurring in 21-40 years age groups with mean age is 38.6 years, least affected victims 1.4% in 1-10 years group and 10.1% in 61 year and above.[Table 1]

**Table 1 : Age and Sexwise distribution of all Transport Accident deaths**

| Age Group (years) | Sex | | Total |
|---|---|---|---|
| | Male | Female | |
| 1-10 | 2 (1.7 % ) | 0 ( Nil) | 2 (1.4%) |
| 11-20 | 13 ( 11.1% ) | 3 (13.6% ) | 16 (11.5%) |
| 21-30 | 33 (28.2 % ) | 5 (22.7% ) | 38 (27.3%) |
| 31-40 | 22 (18.8 % ) | 5 (22.7%) | 27 (19.4%) |
| 41-50 | 19 (16.3 % ) | 3 (13.6%) | 22 (15.8%) |
| 51-60 | 15 ( 12.8 % ) | 5 (22.7%) | 20 (14.4%) |
| 61 and above | 13 ( 11.1 % ) | 1 (4.5%) | 14 (10.1%) |
| **Total** | **117 (84.17 % )** | **22 (15.8%)** | **139 (100%)** |

Most (69.7%) of the deceased were drivers themselves and the rest were pedestrians (30.3%). [Table 2]

**Table 2: Distribution of deaths according to the characteristics of the deceased**

| | |
|---|---|
| Death of Driver of any vehicle | 97(69.7%) |
| Death of Pedestrians in Road Transport Accident | 42(30.3%) |
| **Total** | 139(100%) |

The results shows that there were maximum use of Two Wheelers (37.4%) followed by pedestrians (30.2%) and car (12.9%). In males two wheeler users were more (40.1%) as compared to female users (22.7%).Half of all females were pedestrians at the time of accidents. [Table 3]

**Table 3: Genderwise distribution of External Causes of Mortality due to Transport Accidents**

| Mode of Transport | Male | Female | Total |
|---|---|---|---|
| Pedestrians injured in transport accident (V01 to V09) | 31(26.4%) | 11(50%) | 42(30.2%) |
| Pedal cycle injured in transport accident (V10 to V19) | 7(5.9%) | 5(22.7%) | 12(8.6%) |
| Two Wheelers injured in transport accident (V20 to V29) | 47(40.1%) | 5(22.7%) | 52(37.4%) |
| Three Wheeler injured in transport accident (V30 to V39) | 6(5.1%) | 1(4.5%) | 7(5%) |
| Car injured in transport accident (V40 to V49) | 17(14.5%) | 1(4.5%) | 18(12.9%) |
| Van injured in transport accident (V50 to V59) | 1(0.8%) | 0 | 1(0.7%) |
| Truck injured in transport accident (V60 to V69) | 5(4.2%) | 0 | 5(12.9%) |
| Bus injured in transport accident (V70 to V79) | 2(1.6%) | 0 | 2(1.4%) |
| **Total Fatal Transport Accidents** | **117** | **22** | **139** |

Out of total 139 Victims who died, maximum were hit by car (35.2%) followed by truck or tractor (18.7%). While 46.7% of fatal accidents occurred in the occupants of four wheelers (Pick- up van and Car ) and another 30.2% occurred in occupants of heavy transport vehicles (bus and truck), two wheeler riders constituted (15.8%). [Table 4]

**Table 4 : Distribution of Transport Accidents by the Vehicle involved in the Accident**

| Type of Vehicle | Male (%) | Female (%) | Total (%) |
|---|---|---|---|
| Two Wheeler (Motor cycle) rider injured in transport accident (V20 to V29) | 20 (91) ***(17.1)*** | 2 (9) ***(9.0)*** | 22(100) |
| Three Wheeler occupant injured in transport accident (V30 to V39) | 7 (77.7) ***(5.9)*** | 2 (22.3) ***(9.0)*** | 9(100) |
| Car occupant injured in transport accident(V40 to V49) | 40 (81.6) ***(34.2)*** | 9 (18.4) ***(9.0)*** | 49(100) |
| Pickup Truck or Van occupant injured in transport accident (V50 to V59) | 14 (87.5) ***(12.0)*** | 2 (12.5) ***(9.0)*** | 16(100) |
| Occupant of Heavy transport vehicle (Truck) injured in transport accident (V60 to V69) | 23 (88.4) ***(19.6)*** | 3 (11.6) ***(13.6)*** | 26(100) |
| Occupant of Heavy transport vehicle (Bus) injured in transport accident (V70 to V79) | 14 (73.6) ***(12)*** | 5 (26.4) ***(22.7)*** | 19(100) |
| **Total Fatal Transport Accidents** | **117 (84.2)** | **22 (15.8)** | **139 (100)** |

Note: Percentages are computed from total number of fatal accidents of the Occupants according to type of vehicle involved (in each row)

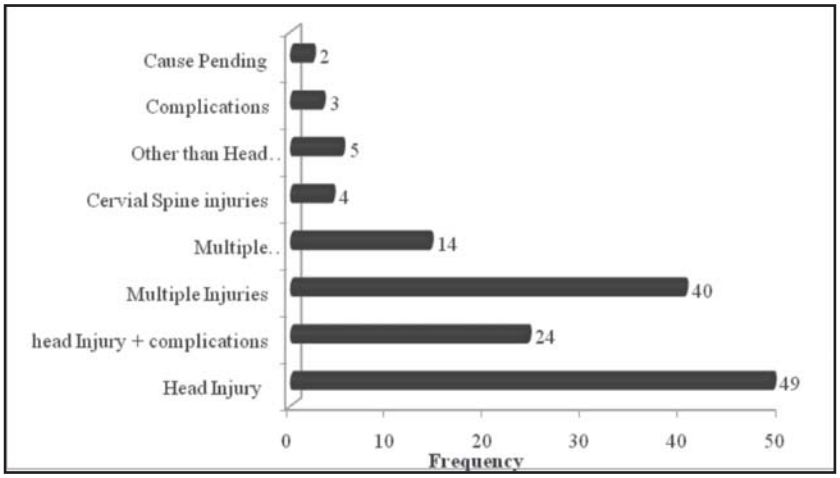
***Percentages in Italics and bold are computed from total number of fatal accidents in each sex***

Out of 64 two wheelers user maximum deaths by car (39%) followed by Light motor vehicle (17.9%) and two wheeler (17.1%). In 42 pedestrians, fatal accidents due to two wheeler (30.9%) followed by Truck Tractor (26.1%) and Bus (10.9%). [Table 5]

**Table 5: Two Wheeler riders and pedestrians involved in fatal accidents**

| Type of Vehicle involved | Pedestrians injured in transport accident (V01 to V09) | Two Wheeler rider injured in transport accident (V20 to V29) | Total |
|---|---|---|---|
| Two Wheeler | 13(30.9%)(V02) | 11(17.1%)(V22) | 24(22.6%) |
| Three Wheeler | 1(2.3%)(V02) | 6(9.3%)(V22) | 7(6.6%) |
| Car | 5(11.9%)(V03) | 25(39.0%)(V23) | 50(47.1%) |
| Van | 3(7.1%)(V03) | 7(17.9%)(V23) | 10(9.4%) |
| Truck Tractor | 11(26.1%)(V04) | 8(12.5%)(V24) | 19(17.9%) |
| Bus injured | 9(21.4%)(V04) | 7(10.9%)(V24) | 16(15%) |
| **Total** | **42** | **64** | **106** |

**Figure1 : Distribution according to underlying cause of death**




It is observed in the above figure, that 73 (52%) of deaths were due to head injury and head injury plus complications and rest 48% were due to injuries at other sites or multiple sites.

**Discussion :**

Maximum Deaths occurred in males 117 (84.2%) and the rest 22 (15.83%) were in the females. Sex ratio of death was 5.3: 1. Mean age at death was 38.6 ± 16.4 years. Highest number of death occurred in the 21-50 years age group 87 (62.6%) out of which 38 (43.6%) deaths were in the 21-30 years age group. In females, maximum affected victim's 38(27.3%) in the 21-30 year age group.

Moshiro C et al (2005)in their study found that males had significantly increased risk of transport injuries as compared to females. [8] 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) in their study found 83% victims to be male and 17% female victims. [9] 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) in their study in Nagpur found that number of male victims(85.8%) was more as compared to female victims (14.2%).[10] The results are similar to our study. They found male to female ration of 6:1.

Pedestrians (V01 to V09) and two wheelers (V20 toV29) maximum affected victim, 30.2% and 46%.In the counterpart, out of 64 two wheeler riders,

maximum were hit by car (39%) followed by Light motor vehicle (17.9%) and by another two wheeler (17.1%). Amongst 42 Pedestrians who met with fatal accident, the culprits were two wheelers (30.9%) followed by Truck or Tractor (26.1%) and Bus (21.4%).52% of deaths due to head injury and head injury and complications and rest 48% due to other injury.

**Conclusion :**

RTA continues affecting the country's economic development and lives are lost in the most reproductive age group. There is need for better and effective policy on road safety, constructing road network, ensuring proper scrutiny of individuals before issuing their driving license, educating the public on road safety.

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# Evaluation of Cold Chain System at PHCs (Primary Health Centers) of Rajkot District, Gujarat

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**Abstract :**

**Introduction:** Immunization of all children with potent vaccines is as important as to achieve desired immunization coverage in the fight against vaccine preventable diseases. Cold chain is an important device to maintain the efficacy and potency of the vaccine intact. **Objectives :** (1) To assess the adequacy of logistics required for proper cold chain maintenance. (2) To assess the quality of maintenance of the cold chain equipments. (3) To identify the gaps and help in correcting them. **Method :** A cross sectional study in the areas of Rajkot district was conducted during the period April 2013 to March 2015. Convenient Random Sampling technique was applied. Pretested semi-structured check list used as a study tool. **Results :** 73% of the cold chain handlers found trained for cold chain maintenance. At two sites ILR and DF were not available. Few sites were lacking in thermometer (8.3% DFs), vaccine carrier (5.3%), cold box (5.3%) or ice packs (2.6). At 100% sites vaccines were stored inside ILR and temperature of ILR was in the desired range of two to eight degree centigrade. Updated temperature log books found at 86.1% sites. Proper ice packs arrangement inside the DF in 83.3% cases. Only 85% BCG vials ad 93% of measles vials were having time of reconstitution written on the vials. Open vial policy was also followed only at about 75% sites on average. **Conclusion :** There are no issues with infrastructure, equipments or logistics. Quality cold chain maintenance especially in the areas of maintaining temperature record, following open vial policy, writing time of reconstitution on the vial etc have scopes for improvement. All these can be done by quality supervision.

**Key words :** cold chain, evaluation

## Introduction :

India has one of the largest immunization program in the world.[1]Immunization is one of the most cost-effective strategy in reducing childhood morbidity and mortality.[2,3]In order to realize the full benefits of immunization, coverage of vaccination has to be increased and more importantly potent vaccines should reach the beneficiaries for which cold chain maintenance is crucial.[1,4]

Cold chain maintenance is a continuous and cohesive process of preserving vaccines to ensure their availability and to maintain potency. Cold chain maintenance is a term defined as the materials, equipments and procedures used to maintain temperatures between +2° C to +8 °C while in transit throughout the distribution and storage process for vaccines from the manufacture point up to the beneficiary; whereas cold chain also includes the people i.e. health workers also engaged to maintain the equipment and temperature at peripheral levels.[5,6] A cold chain break denotes a disruption in "cold chain maintenance", which could contribute to significant clinical outcomes, such as adverse reactions and/or missed opportunities to vaccinate.[5]

While there are various internal factors that operate in sero-conversion of individuals, which are not under control, there are many external factors such as maintenance of cold chain, which determine vaccine potency. Vaccines when not stored or transported at an appropriate temperature can lose their potency and not effective if administered to the beneficiary.[3]

## Objectives :

- To assess the adequacy of logistics required for proper cold chain maintenance.
- To assess the quality of maintenance of the cold chain equipments.

- To identify the gaps and help in correcting them.

**Method :**

**Study Design :** The study was designed as cross sectional study

**Sampling Technique :** Convenient Random Sampling was applied to select a desired sample. All the PHCs were divided in two broad groups: High Priority Talukas (HPTs) and Non-High Priority Talukas (NHPTs). Equal number of samples was selected from both the groups.

**Sample Size :** All the visits made in the time frame of April 2013 to March 2015 were included in the study. Total 38 PHC visits are included in the study. Among which 19 visits were of HPTs and 19 visits from NHPTs.

**Study Period :** Two years, from April 2013 to March 2015.

As per the guideline from the Health & Family Welfare Department, Gujarat State Regional Monitoring Team (RMT) members, PDU Medical College, Rajkot make regular visits of allotted areas. There are 36 Primary Health Centres (PHCs) in Rajkot district. As per the guideline from the state, Talukas are divided in High Priority Talukas (HPT) and Priority Talukas (PT) and Normal Priority Talukas (NPT).[19]As per the state policy it was instructed to make visits of HPTs to others in the proportion of 1:3. The standard semi-structured pretested questioner was used as a tool of study. Medical Officers and District Health Officers were informed prior the visits. Important information regarding, human resources involved in cold chain handling, equipments necessary for cold chain maintenance and quality of cold chain maintenance at both PHC (Facility Site level) and VHND Site ( Village Health and Nutrition Day Sites). VHND is famously known as Mamata Divas in Gujarat, where all the services related to Maternal and child health services are provided. Basic services like, immunization services, ANC check up, nutritional supplements, health check up and treatment of children, PNC check up and advises, adolescent girl immunization and health education, etc are provided at least once a month at almost all villages on a fixed day, fixed site with the help of skilled team lead by Female Health Worker (FHW).

Handbook on immunization guidelines by the government of India recommended that each equipment should be connected to voltage stabilizer with permanently secure plug and socket.[8] The GOI protocol also recommended that ice-lined refrigerators and deep freezers be supported on wooden blocks and be located at least 10 centimeters away from walls.[9] As per Guideline given in Handbook on immunization by the government of India it is recommended that t-series vaccines (i.e, Hepatitis B, DPT, Pentavalent and TT vaccines) must not be freezed during its storage, because they are cold freeze sensitive vaccines and lose its effectiveness if freezed.[8]

The data entry and analysis was done using Microsoft office excels.

**Results :**

**Table 1: Distribution of various PHCs as per the available trained human resources for Routine Immunization**

| Sr. No. | Characteristics | Frequency (f) | Percentage (%) |
|---|---|---|---|
| 1 | MO training status (N=35)* | | |
| | Trained for Routine Immunization | 30 | 75.7 |
| | Not trained for Routine Immunization | 05 | 24.3 |
| | Total | 35 | 100.0 |
| 2 | Cold chain handler training status (N=38) | | |
| | Trained for cold chain maintenance | 28 | 73.0 |
| | Not trained for cold chain maintenance | 10 | 27.0 |
| | **Total** | **38** | **100.0** |

*At three PHCs post of Medical Officers were vacant.

It was found in present study that 3 out of 38 visited PHCs had vacant posts for Medical Officers. In the rest of the centers having filled posts of Medical Officers around three fourth (75.7%) were found trained for the routine immunization. [Table 1] Similar kind of picture was found for the cold chain handlers, the pharmacist most of the times or may be other identified staff in case of post vacant. 73% of the cold chain handlers were found trained for cold chain maintenance. [Table 1]

**Table 2: Availability of necessary cold chain equipments at PHCs**

| Sr. No. | Equipments (N=38) | Frequency (f) | Percentage (%) |
|---|---|---|---|
| 1 | Functional ILR | 36 | 94.7 |
| 2 | Functional DF | 36 | 94.7 |
| 3 | Thermometers for ILR* | 36 | 100.0 |
| 4 | Thermometers for DF* | 33 | 91.7 |
| 5 | Stabilizer for ILR* | 35 | 97.2 |
| 6 | Stabilizer for DF* | 35 | 97.2 |
| 7 | Wooden or other stand for ILR* | 36 | 100.0 |
| 8 | Wooden or other stand for DF* | 36 | 100.0 |
| 9 | Cold boxes | 36 | 94.7 |
| 10 | Adequate number of vaccine carriers | 36 | 94.7 |
| 11 | Ice packs in adequate amount | 37 | 97.4 |

* Percentage is calculated using N=36

The present study observed that there is almost no issue of equipments. At two sites Ice Lined Refrigerator (ILR) and Deep Freezer (DF) were not available. The reason was that they were newly built PHCs and the vaccine supply was from the nearby PHC. [Table 2] The present study findings say that few sites were lacking in thermometer (8.3% DFs), vaccine carrier (5.3%), cold box (5.3%) or ice packs (2.6), but that all are in single digit of percentage. [Table 2]

**Table 3: Maintenance of cold chain equipments and related records at PHCs**

| Sr. No. | Maintenance of cold chain (N=36) | Frequency (f) | Percentage (%) |
|---|---|---|---|
| 1 | Storage of all vaccines inside ILR | 36 | 100.0 |
| 2 | Temperature inside ILR between 2-8 | 36 | 100.0 |
| 3 | Temperature log book updated | 31 | 86.1 |
| 4 | Frozen DPT/DT/TT/Hep B | 0 | 0.0 |
| 5 | Expired vaccines | 1 | 2.7 |
| 6 | Other medicines stored inside ILR | 0 | 0.0 |
| 7 | Icepacks correctly arranged | 30 | 83.3 |

Our study shown that ice packs arrangement inside the DF was proper in 83.3% cases where still scopes of improvement and efforts. [Table 3]

In our study we found that at 100% sites vaccines were stored inside ILR and temperature of ILR was in the desired range of two to eight degree centigrade. [Table 3]In our study nowhere we found frozen t-series vaccine (i.e, Hepatitis B, DPT,

Pentavalent and TT vaccines) or other medicines found inside ILR. At one site expired vaccine vial was found inside the ILR. Updated temperature log books found at 86.1% sites. [Table 3]

**Table 4 : Quality of cold chain maintenance at VHND sites**

| Sr. No. | Quality of cold chain (N=38) | Frequency (f) | Percentage (%) |
|---|---|---|---|
| 1 | Vaccines/diluents placed in zipper bag | 37 | 97.4 |
| 2 | Vaccines/diluents placed in vaccine carrier having 4 conditioned ice-packs | 38 | 100.0 |
| 3 | Vaccine without label/unreadable | 00 | 0.0 |
| 4 | VVM stage III/IV | 01 | 2.7 |
| 5 | Expired vaccine | 00 | 0.0 |
| 6 | Frozen t-series vaccine | 01 | 2.7 |
| 7 | Time of reconstitution written on reconstituted BCG (n=20) | 17 | 85.0 |
| 8 | Time of reconstitution written on reconstituted Measles (n=29) | 27 | 93.1 |
| 9 | Time and date of opening written on the vial of Pentavalent (n=34) | 24 | 70.6 |
| 10 | Time and date of opening written on the vial of DPT (n=31) | 24 | 77.4 |
| 11 | Time and date of opening written on the vial of TT (n=34) | 25 | 73.5 |

Vaccine Vial Monitor (VVM) is a heat sensitive device. Its heat sensitive portion changes its color from white to dark black irreversibly in phase wise manner once exposed to heat or sunlight. There are four stages of VVM. It guides the field workers if can be used or should be discarded. As per the guideline vaccine can be used in VVM stage I and II and should be discarded if found with VVM stage III or IV.[8]Our study shown that at one site vaccine vial with Vaccine Vial Monitor (VVM) III/IV found in use, while at one site frozen DPT vaccine was found in use. [Table 4] Only 85% BCG vials ad 93% of measles vials were having time of reconstitution written on the vials which must be 100% for ideal practice to avoid major Adverse Effects Following Immunization (AEFI). Since 2013 open vial policy is implemented in the state of Gujarat and it was revised in year 2015. According to the guideline of open vial policy, OPV, Hepatitis B, DPT, Pentavalent, TT and IPV vaccines can be used up to four weeks from the day of opening if proper cold chain maintenance is assured and VVM is in the usable state.[20] For assuring the same date and time of opening vials are to be written on the vial. Open vial policy was also followed only at about 75% sites on average. Unlabeled vials for time of opening under open vial policy can lose its potency if not used and stored as per the guidelines. [Table 4]

**Discussion :**

It was found in present study that the 73% cold chain handlers, the pharmacist most of the times or may be other identified staff in case of post vacant, were found trained for cold chain maintenance. Mallik S. et al [7] also observed that one designated worker as cold chain handler was in 95% of organizations.

The present study observed that there is almost no issue of equipments. At two sites ILR and DF were not available. The reason was that they were newly built PHCs and the vaccine supply was from the nearby PHC. Lalitha Krishnapuram et al[10] reported that except for one centre where domestic

refrigerator was used for storing vaccines, all other centers (97%) used ILR exclusively for vaccine storage and were in good working condition. Our study findings were similar to that observed by Rao et al [11] (98.6%); and Goel et al[12] (92.5%). However the finding of study by Doeki et al[13] (78%) was less compared to other studies.

The present study findings say that few sites were lacking in thermometer (8.3% DFs), vaccine carrier (5.3%), cold box (5.3%) or ice packs (2.6%), but that all are in single digit of percentage. The similar findings are noted by study of Lalitha Krishnappa et al who observed that only 31 ILR (97.14%) had functional thermometer of which 21 were stem thermometer and 10 were dial thermometer.[10]

It was recommended that ice-lined refrigerators, deep freezers and refrigerators would maintain a temperature of 2° to 8° C and a temperature maintenance chart.[8,9]In our study we found that at 100% sites vaccines were stored inside ILR and temperature of ILR was in the desired range of two to eight degree centigrade. Mallik S. et al observed that 55% of the organizations maintained temperature chart, 60% recorded temperature twice and 80% maintained temperature in optimal range.[7] A study in Canada had shown that the general and pediatric practice offices had maintained temperature chart, but only one third had temperature within limits.[14]Lalitha Krishnappa et al observed that in 8 (23.5%) ILRs temperature was not in the recommend range. [10]These results concurred with findings of Samanth et al who found that 75% of ILR in primary health centers in rural area [15] and Mallik et al in 80% of centers in metro city maintained temperature in optimal range. [7] In a study done by Harsha Kumar et. al correct temperature was not maintained in 31.25% of the studied health centres.[16]

In our study nowhere we found frozen t-series vaccine or other medicines found inside ILR. At one site expired vaccine vial was found inside the ILR. Updated temperature log books found at 86.1% sites. Lalitha Krishnappa et al reported that in 91% maintained temperature monitoring chart adequately.[10] Alike findings are noted in other studies, 94.2% (Rao et al), 55%(Mallik et al) and 65% (Samanth et al) of the centers have adequately maintained the temperature monitoring chart.[11,7,15]

As per guidelines, ice packs need to be stacked in criss-cross manner in deep freezer.[17] This allow even distribution of temperature and proper preparation of ice-packs. Our study shown that ice packs arrangement inside the DF was proper in 83.3% cases where still scopes of improvement and efforts. Lalitha Krishnappa et al reported that criss-cross arrangement of ice packs was seen only in 23%.[10] Similar observations made in one-third of the health centres of Surat city.[18]

Our study shown that at one site vaccine vial with VVM III/IV found in use, while at one site frozen DPT vaccine was found in use. Lalitha Krishnappa et al reported in the study that about 97.1% of the centers, the vaccines were in usable condition i.e. in stage-1 and stage-2.[10] Only 85% BCG vials ad 93% of measles vials were having time of reconstitution written on the vials which must be 100% for ideal practice to avoid major AEFIs. Open vial policy was also followed only at about 75% sites on average. Unlabeled vials for time of opening under open vial policy can lose its potency if not used and stored as per the guidelines.

**Conclusion and Recommendations :**

Infrastructure, equipments and logistics are no more an issue. But still quality maintenance has scopes of improvement. Frozen t-series vaccine and vaccine with VVM stage III/IV itself suggests that temperature maintenance in the desired range is not maintained all the time. The same thing is indirectly reflected with gap in temperature log book maintenance. Still more serious issues found are not writing date and time of opening of vial which may again raise doubt of vaccine efficacy if open vial policy is not well followed. In case of vaccine vials like BCG and measles not writing time of reconstitution may lead to major AEFI and can lead to adverse impact on the program. The identified issues were corrected on the spot with the help of concerned staff when possible, else communicated to the concerned person right from grass root level (Health Supervisor) to State authorities for needful actions. The findings

were shared with Taluka officials by telephonic talk, and by e-mail reports with MOs, THOs, CDHO, RCHO, State Immunization Officer and Additional Director (FW) for feedback and corrections if any required. The major gap identified was the quality of supervision. All the issues found can be well handled with tactful supportive supervision and vigilant monitoring.

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# A Study on the Assessment of Nutritional Status among Geriatric Population in Jamnagar City

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**Abstract :**

**Introduction :** Aging is a natural process. The effect of nutritional status on physical and psychological well being is especially high in elderly. The nutritional status and needs of elderly people are associated with age-related biological and often socioeconomic changes. A comprehensive tool specifically developed for use with elderly people is the Mini-Nutritional Assessment (MNA). **Objectives:** 1) To assess the nutritional status of elderly by use of MNA (Mini Nutritional Assessment) tool. 2) To compare the MNA score (Nutritional status) with different socio demographic variables. **Method :** This was a cross sectional descriptive study to assess the nutritional and status among geriatric population(Aged ≥ 60 years) in an urban area. The study was carried out from January 2012 to December 2012 with sample size of 400. **Results :** Out of total 400 elderly subjects, almost two-third had normal nutritional status while 30.25% were at risk of malnutrition and only 6.75% were malnourished according to MNA score. There was a significantly high proportion of elderly with chronic morbidity was malnourished (11.79%) and at risk of malnutrition (37.44%). **Conclusion :** Prevalence of malnutrition and at risk of malnutrition was significantly higher in retired, illiterate and economically dependent elderly. Management of malnutrition in the elderly population requires the involvement of multiple disciplines for its diagnosis and treatment.

**Key Words :** Nutritional status, MNA (Mini Nutritional Assessment) score, Geriatric population,

## Introduction :

Aging is a natural process. [1] Old age should be regarded as a normal, inevitable biological phenomenon. [2] The population over the age of 60 years has tripled in last 50 years in India and will relentlessly increase in near future. In 2001, the proportion of older people was 7.7% which will increase to 8.94% in 2016.[3] The effect of nutritional status on physical and psychological well being is especially high in elderly.[4] The nutritional status and needs of elderly people are associated with age-related biological and often socioeconomic changes.[5] Malnutrition leads to dependency; dependency interferes with the health and quality of life, not only for the elderly, but also for relatives and health-care providers.[6]

A comprehensive tool specifically developed for use with elderly people is the Mini-Nutritional Assessment (MNA): this is a rapid and simple tool for evaluating the nutritional state of the frail elderly, which allows, if necessary, for nutritional intervention and/or diet modification. [7]Therefore, the present study was carried out to assess the nutritional status of elderly and to compare the MNA score (Nutritional status) with different socio demographic variables.

## Method :

This was a cross sectional descriptive study to assess the nutritional and status among geriatric population in an urban area (non-slum and slum). The study was carried out from January 2012 to December 2012. It is a cross sectional study so for estimating a population proportion with specified relation precision, [8] formula is

$N = Z^2_{1-\alpha/2} P(1-P)/\varepsilon^2$

In this,

N=Sample size

1-α = confidence level

$Z_{1-\alpha/2}$ = Represent the number of standard errors from the mean ($Z_1$-α/2 is function of confidence level).

P= anticipated population proportion

ε= Relating precision.

Since P value from previous studies on the topic of present study is not available an anticipated P value should be taken as 50%. At p= 0.50 (50%) & ε = 10%, a sample size of 384 would be needed.[8] To make a round figure sample size has been taken 400 instead of 384.There are 19 wards and 64 slum pockets in this Municipal Corporation area. By simple random sampling ward no. 3, 6, 9 and 13 were chosen for study. From each ward 100 subjects were studied by simple random sampling. Out of 100, 50 were taken from the non-slum areas and 50 were taken from the slum areas.

Pre-tested and semi-structured questionnaire was used for collecting data. The study subjects were interviewed through house to house visits. Informed consent was taken from the participants by initially explaining the purpose of the study and knowing their willingness to share the information.The data were entered in the computer, using the Microsoft office excel 2007. Analysis was also done using the epi-info software and chi-squaretest and logistic regression tests were applied. Ethical approval was taken before the commencement of the study from the ethical committee of the concerned institution.

Economic dependent can be defined as, those who were economically dependent on others and they didn't have any personal income source. Chronic morbidity can be defined as, any deviation from normal health for long period of time.

**MNA (Mini Nutritional Assessment)**

The MNA is a very simple non-invasive, easy to administer, patient-friendly, non-expensive, very sensitive, highly specific, reliable and validated screening tool for malnutrition in the elderly.[9, 10]

Interpretation of scores is done as follows:

Score <17 : Malnourished
Score 17-23.5 : At risk of malnutrition
Score >23.5 : Normal nutritional status

**Exclusion criteria :**

- Bed ridden elderly people
- Mentally unstable elderly people

**Mini Nutritional Assessment**

**Screening**

A **Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?**
0 = severe decrease in food intake
1 = moderate decrease in food intake
2 = no decrease in food intake ☐

B **Weight loss during the last 3 months**
0 = weight loss greater than 3kg (6.6lbs)
1 = does not know
2 = weight loss between 1 and 3kg (2.2 and 6.6 lbs)
3 = no weight loss ☐

C **Mobility**
0 = bed or chair bound
1 = able to get out of bed / chair but does not go out
2 = goes out ☐

D **Has suffered psychological stress or acute disease in the past 3 months?**
0 = yes 2 = no ☐

E **Neuropsychological problems**
0 = severe dementia or depression
1 = mild dementia
2 = no psychological problems ☐

J **How many full meals does the patient eat daily?**
0 = 1 meal
1 = 2 meals
2 = 3 meals ☐

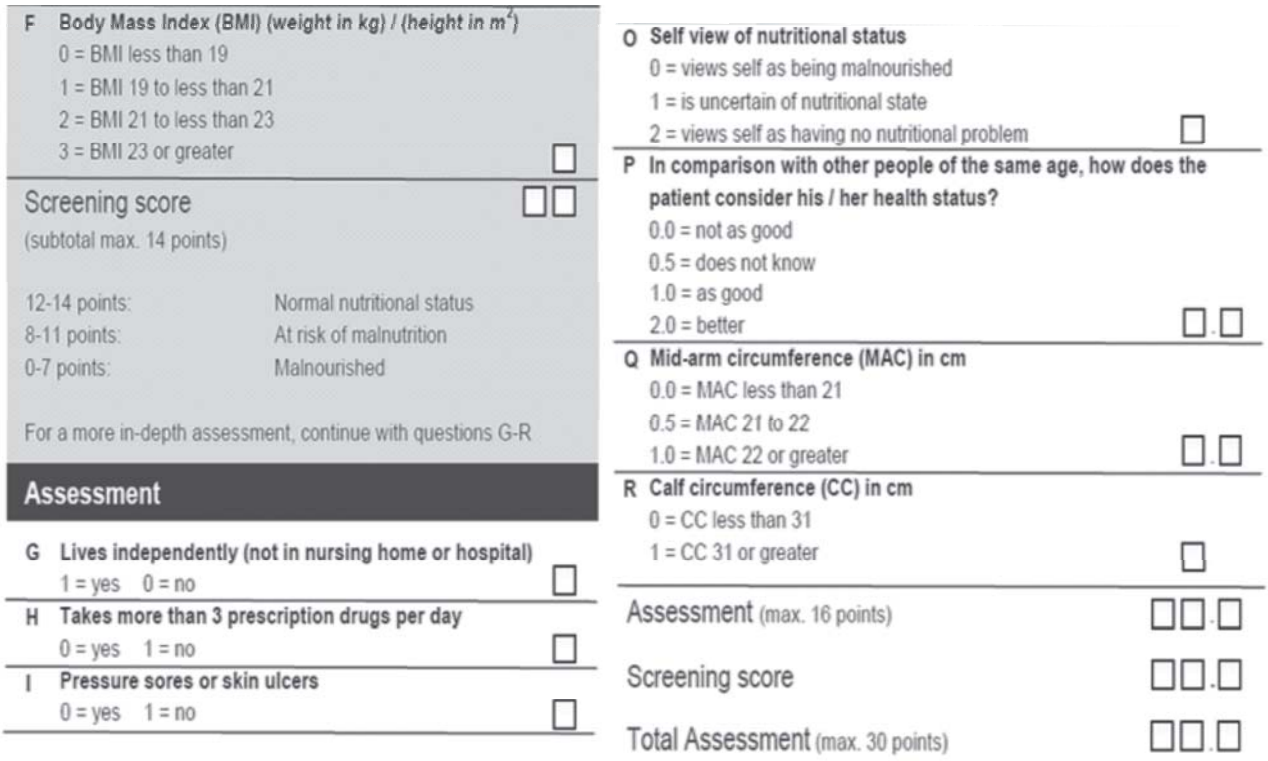
K **Selected consumption markers for protein intake**
- At least one serving of dairy products (milk, cheese, yoghurt) per day yes ☐ no ☐
- Two or more servings of legumes or eggs per week yes ☐ no ☐
- Meat, fish or poultry every day yes ☐ no ☐

0.0 = if 0 or 1 yes
0.5 = if 2 yes
1.0 = if 3 yes ☐☐

L **Consumes two or more servings of fruit or vegetables per day?**
0 = no 1 = yes ☐

M **How much fluid (water, juice, coffee, tea, milk...) is consumed per day?**
0.0 = less than 3 cups
0.5 = 3 to 5 cups
1.0 = more than 5 cups ☐☐

N **Mode of feeding**
0 = unable to eat without assistance
1 = self-fed with some difficulty
2 = self-fed without any problem ☐



F Body Mass Index (BMI) (weight in kg) / (height in $m^2$)
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater

Screening score
(subtotal max. 14 points)

12-14 points: Normal nutritional status
8-11 points: At risk of malnutrition
0-7 points: Malnourished

For a more in-depth assessment, continue with questions G-R

Assessment

G Lives independently (not in nursing home or hospital)
1 = yes 0 = no

H Takes more than 3 prescription drugs per day
0 = yes 1 = no

I Pressure sores or skin ulcers
0 = yes 1 = no

O Self view of nutritional status
0 = views self as being malnourished
1 = is uncertain of nutritional state
2 = views self as having no nutritional problem

P In comparison with other people of the same age, how does the patient consider his / her health status?
0.0 = not as good
0.5 = does not know
1.0 = as good
2.0 = better

Q Mid-arm circumference (MAC) in cm
0.0 = MAC less than 21
0.5 = MAC 21 to 22
1.0 = MAC 22 or greater

R Calf circumference (CC) in cm
0 = CC less than 31
1 = CC 31 or greater

Assessment (max. 16 points)

Screening score

Total Assessment (max. 30 points)

**Results :**

The study was conducted with 400 elderly people (Aged ≥ 60 years). Out of total 400 elderly subjects, almost two-third had normal nutritional status while 30.25% were at risk of malnutrition and only 6.75% were malnourished according to MNA score. The findings were comparable among urban non-slum area and urban slum area. (Table 1)

**Table 1: Nutritional status of the study subjects according to Mini Nutritional Assessment (MNA) score**

| Nutritional status (Score) | Urban area | | | | Total | |
|---|---|---|---|---|---|---|
| | Non-slum | | Slum | | | |
| | No. | % | No. | % | No. | % |
| Well nourished (24-30) | 123 | 61.5 | 129 | 64.5 | 252 | 63 |
| At risk of malnutrition (17-23.5) | 67 | 33.5 | 54 | 27 | 121 | 30.25 |
| Malnourished (<17) | 10 | 5 | 17 | 8.5 | 27 | 6.75 |
| Total | 200 | 100 | 200 | 100 | 400 | 100 |

$\chi^2$*=3.35, df=2, p=0.187*

Nearly one third of the elderly (29.51%) aged ≥ 75 years were found malnourished while more than half of them (57.38%) were at risk of malnutrition. In the age group of 60-74 years, only 2.65% elderly were malnourished. It is evident that as the age increases, malnutrition and risk of malnutrition increases. The statistical analysis did not show any significant difference between elderly males and females with respect to MNA scores. Out of the total illiterate elderly, 38.54% were well nourished and 37.5% were at risk of malnutrition according to MNA score. The statistically significant association was found between economic dependency status and nutritional status of elderly. Proportion of malnutrition was high among the elderly living in the three generation family where as high proportion of well nourished elderly was observed in those living in the joint family followed by those in nuclear family. Prevalence of malnutrition and at risk of malnutrition was significantly higher in retired elderly in comparison to persons who were working (Table 2).

**Table 2: Association between nutritional status and socio demographic variables**

| Socio demographic variables | | Nutritional Status | | | | | | Total n=400 | | p value |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Malnourished n=27 | | At risk of malnutrition n=121 | | Well nourished n=252 | | | | |
| | | No. | % | No. | % | No. | % | No. | % | |
| Age (years) | 60-74 | 9 | 2.65 | 86 | 25.37 | 244 | 71.98 | 339 | 100 | <0.001 |
| | ≥75 | 18 | 29.51 | 35 | 57.38 | 8 | 13.11 | 61 | 100 | |
| Gender | Male | 19 | 9.27 | 56 | 27.32 | 130 | 63.41 | 205 | 100 | 0.076 |
| | Female | 8 | 4.10 | 65 | 33.33 | 122 | 62.57 | 195 | 100 | |
| Literacy-status | Illiterate | 23 | 23.96 | 36 | 37.5 | 37 | 38.54 | 96 | 100 | <0.001 |
| | Literate | 4 | 1.32 | 85 | 27.96 | 215 | 70.72 | 304 | 100 | |
| Economic dependency status | Dependent | 25 | 8.33 | 107 | 35.67 | 168 | 56 | 300 | 100 | <0.001 |
| | Independent | 2 | 2 | 14 | 14 | 84 | 84 | 100 | 100 | |
| Type of family | Nuclear | 4 | 2.44 | 50 | 30.49 | 110 | 67.07 | 164 | 100 | 0.015 |
| | Joint | 0 | 0 | 13 | 13.54 | 83 | 86.46 | 96 | 100 | |
| | Three generation | 23 | 16.43 | 58 | 41.43 | 59 | 42.14 | 140 | 100 | |
| Occupation | Retired | 25 | 13.09 | 95 | 49.74 | 71 | 37.17 | 191 | 100 | <0.001 |
| | Working | 2 | 0.96 | 26 | 12.44 | 181 | 86.60 | 209 | 100 | |

**Table 3: Association between nutritional status and chronic morbidity status**

| Chronic morbidity | Nutritional Status | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Malnourished | | At risk of malnutrition | | Well nourished | | | |
| | No. | % | No. | % | No. | % | No. | % |
| Present | 23 | 11.79 | 73 | 37.44 | 99 | 50.77 | 195 | 100 |
| Absent | 4 | 1.95 | 48 | 23.42 | 153 | 74.63 | 205 | 100 |
| Total | 27 | 6.75 | 121 | 30.25 | 252 | 63 | 400 | 100 |

***$\chi^2$=29.88, df=2, p<0.001***

**Table 4: Application of logistic regression between nutritional status (MNA score) and socio-demographic variables.**

| Term | Odds Ratio | 95% Confidence interval | Coefficient | Standard Error | Z-Statistics | P-Value |
|---|---|---|---|---|---|---|
| **Age** | 12.4511 | 5.5916 - 27.7255 | 2.5218 | 0.4084 | 6.1741 | 0.0001 |
| **Chronic morbidity** | 1.6889 | 1.0465 - 2.7256 | 0.5241 | 0.2442 | 2.1462 | 0.0319 |
| **Economic dependency status** | 3.5638 | 1.8102 - 7.0159 | 1.2708 | 0.3456 | 3.6771 | 0.0002 |
| **Gender** | 0.6773 | 0.4068 - 1.1276 | -0.3897 | 0.2601 | -1.4983 | 0.1340 |

Significantly higher proportions of elderly with chronic morbidity were malnourished (11.79%) and at risk of malnutrition (37.44%) as compared to those without chronic morbidity (1.95% and 23.42% respectively) (Table 3).

On applying logistic regression, there was significant association between nutritional status and age, chronic morbidity and economic dependency status while no association was found between nutritional status and gender (Table 4).

**Discussion :**

In the present study almost two-third had normal nutritional status while 30.25% were at risk of malnutrition and only 6.75% were malnourished according to MNA score. The findings of higher percentage of elderly population at risk of malnutrition corroborate with the study of Bewaja S et al [4] performed in Western Rajasthan and Yadav N et al [11] performed in urban area of Allahabad district while both study reported lower percentage of elderly with normal nutritional status. Bewaja S et al [4] found in their study that, 7.1% elderly were malnourished which is almost similar to the findings of the present study while higher percentage of malnourished (24.97%) was observed in the study done by Yadav N et al [11]. Sharma R [12] in her study found that age of elderly correlated significantly and negatively with the MNA scores which was similar to the findings of present study.

Similar to the present study, Yadav N et al [11] and Sharma R [12] also found that relationship of MNA score (nutritional status) with education was positive and significant. Contradictory to the findings of the present study, Sharma R[12] in her study noted that MNA scores correlated negatively and insignificantly with the type of family.

In the present study, it was found that prevalence of malnutrition and at risk of malnutrition was significantly higher in retired elderly in comparison to persons who were working. Aliabadi M et al [13] also found that the nutritional status was significantly associated with occupation. While Sharma R[12] in her study noted that MNA scores showed a positive but insignificant relationship with the employment status. In the study done by Pai M K[7], it was found that the nutritional status was independent of associated co-morbid illness. Study results showed that 28.6% elders with co morbid illness and 17% without co-morbid illness were malnourished and at risk of malnutrition while 71.4% elderly with co-morbid illness and 83% without co-morbid illness were well nourished.

**Conclusion :**

There is high proportion of elderly people who are malnourished or at risk of malnutrition. Management of malnutrition in the elderly population requires the involvement of multiple disciplines and regular follow up for its diagnosis and treatment. Nutritional assessment and screening of elderly people should be done periodically with simple measures such as, the MNA (Mini Nutritional Assessment) tool, for early detection of malnutrition and to implement an appropriate nutritional intervention.

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# Exploring Hidden Epidemic of Hypertension and Diabetes in Catchment Areas of Rural Health Training Center (RHTC) and Urban Health Training Center (UHTC)of GMERS Medical College, Sola, Ahmadabad through Camp approach.

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**Abstract :**

**Introduction :** Non communicable diseases are no more confined to big cities or upper social class but are also affecting those living in rural areas and slums. Many a times these diseases are asymptomatic hence their detection and linkages with treatment facilities pose a challenge. **Objectives:** Primary objective of this study was to document the camp approach in detecting the hidden cases and linking them with health care system for further management. Additional objective was to assess the utility of camp approach in terms of case yield. **Method :** Total 7 community based (5 rural & 2 urban) screening camps were conducted by Community Medicine Department of GMERS Medical, Sola, Ahmedabad in its rural (Rancharda and urban (Ognaz) field practice areas in Sep 2013. Study tool: A predesigned proforma was used to record epidemiological and clinical details of camp attendee (age, sex, address, height, blood pressure & random blood sugar). A referral sheet was prepared for the referral of the suspected diabetes/hypertension patients to the Medicine Department of our hospitals. Data was entered in MS excel analysed. **Results :** 643 adults (> 20 years)were screened that included 505 (78.5%) rural and 138 (21.5%) urban areas. Females (377) outnumbered males (266).Prevalence of overweight/ obesity was high in urban (38.4%) than in rural (29.1%) areas. Prevalence of hypertension (JNC-7) was 39.2% in rural and 34.1% in urban areas; prevalence of diabetes (RBS >140 mg %) was 25.3% in rural and 24.6% in urban areas. Camps could detect additional 21.6% and 16.3% attendee as suspected of suffering from hypertension and diabetes respectively. Total 48.6% of attendee were suffering from hypertension or diabetes or both (14.8%). Self-care and treatment compliance was poor among known cases – among diabetics, 42 out of 57 (73.7% and among hypertensive, 58 out of 106 (54.7%) had uncontrolled disease status. **Conclusions:** Hypertension and diabetes both being asymptotic, make their detection difficult. Community camps detect this hidden load and facilitate linkage with health system. Early diagnosis/ treatment coupled with non-pharmacological management can prevent the complications. Organizing such camps along with local health staff, with pre camp mobilization and effective linkages with treatment facilities not only detects hidden cases or creates awareness amongst camp attendee and those who accompany them but also reinforce the understanding of known cases and improve their compliance.

**Key words :** Screening camp, Diabetes, Hypertension, RHTC, UHTC

## Introduction :

Hypertension and type 2 diabetes are major risk factors for cardio vascular diseases.[1] Demographic age shift in population and increase in life style related risk factors are leading drivers of this epidemic in India.[2] Pooling of epidemiological studies shows that hypertension is present in 25% urban and 10% rural subjects in India. [3]

Diseases like hypertension, diabetes, obesity etc. are showing astronomical increase in their prevalence in at risk population. Non communicable diseases are no more confined to big cities or amongst people who are from upper social class but are also affecting those who live in rural areas or are slum dwellers. Governments, both at central and state level have taken cognizance of this fact and special cells to

deal with non communicable diseases have been created.

Both diabetes (type 2) and hypertension are leading causes of morbidity and account for bulk of mortality taking place in adult population. They are "silent killers" as initially patients are unaware of disease. Many of them remain asymptomatic or even when they have symptoms, there is little or no realization that these symptoms are due to these diseases. In view of this the most efficient and cost effective way to identify/ diagnose these hidden cases from the community is through screening camps in high risk group. Such suspected cases detected through screening are later subjected to diagnostic tests and are put on the management - non-pharmacological management (life style modification) and lifelong treatment. Persons > 30 years of age are considered as risk group as cases of both diseases are seen less commonly below this age. Needless to say that this camp based approach of active case detection for hypertension, diabetes (type 2) and obesity while restricting the participation only to adults have been tried by many with success. [1, 4, 5]

Field practice areas of GMERS Medical College, Sola, Ahmedabad namely Rancharda (rural) and Ognaj (urban) cater to population of approximately 32000 and 20000 respectively. Areas are jointly served by the local staff of PHC (state health department) and UHC (Ahmedabad Municipal Corporation and the staff provided by Medical College; latter include Lady Medical Officers (LMOs), Public Health Nurses (PHNs), Medical Social Workers, Health Inspectors and Health Educators. Considering the load of non-communicable diseases in the community and poor treatment seeking behaviour more so in relation of such diseases, it was decided to conduct community based camps to detect suspected cases and refer them to medical college for confirmation and initiation of therapy if needed.

**Objectives :**

While the camps were being organized, this study was planned with the aim to (1) document the camp process and assess its efficacy in terms of case yield, (2) detection of hidden cases of hypertension, diabetes (type 2) and obesity in the community and (3) their linkages with health care system.

**Method :**

**Study Settings :** During Aug - Sep 2013, in consultation with health staff at both rural and urban field practice areas, it was decided to organize total 7 community based camps for the detection of cases of hypertension and diabetes. Out of 7 camps 5 were held in the areas of Rural Health Training Centre (RHTC), Rancharda, at its sub centre namely Rancharda, Vansajda, Vadsar, Khatrej and Santej, rest 2 were held in the areas under Urban Health Training Centre (UHTC), Ognaz. Faculty from Medicine department of college participated in these camps. Looking to the age distribution of two diseases participation in the camps was restricted to only those who were above 20 years of age.

**Study Period :** September 2013

**Study Design :** Cross sectional Study

**Study population :** People residing in the field practice areas of RHTC and UHTC and aged more than 20 years were included for screening.

**Study tool :** Predesigned proforma was used to record epidemiological and clinical details of the attendee, age sex, address, height, blood pressure and RBS. A referral sheet was prepared for the referral of the suspected diabetes/hypertension patients to the Medicine Department of our hospitals. Information Education and communication (IEC) material was prepared by our department for awareness and success of this camp. Local health staff along with paramedical staff from medical college moved extensively in the field area (prior to camp) for awareness generation and community mobilization. Information, education and communication (IEC) materials including banners and pamphlets were especially prepared for these camps. While large display banners were kept at the camp site for the benefit of attendee, 3000 copies of printed pamphlets providing the camp details (venue, time & date) and some salient information about the diseases were distributed in the catchment areas 1 - 2 days prior to the scheduled date of camp by paramedical staff.

In the camp flow of attendee was from one table to next and all the information were recorded on a

single case sheet. Height and body weight were recorded by trained paramedical staff using height measuring stand and digital weighing scale. For diabetes screening, glucometer/ gluco-strip were used to measure random blood sugar (RBS) by trained lab technician. Finger prick method was used and cut off point used was > 140 mg% in capillary blood. For hypertension, mercury sphygmomanometer was used and blood pressure was measured by department faculty/LMO/MO of centre in sitting posture. Those who had RBS > 140mg/dl were considered as suspect for diabetes and those having SBP ≥ 140 mmHg &/or DBP ≥ 90 mmHg [6] were considered suspected hypertensive. These suspects were referred to our teaching hospital for confirmation of diagnosis and further management.

**Data Analysis :** Data collected was entered on MS Excel and analyzed and appropriate test of significance was applied.

**Results :**

**Table 1 : Demographic profile of camp attendees**

| | Rural | | | Urban | | |
|---|---|---|---|---|---|---|
| **Age(years)** | **Male** | **Female** | **Total** | **Male** | **Female** | **Total** |
| 21-30 | 30 | 57 | 87 | 3 | 14 | 17 |
| 31-40 | 41 | 74 | 115 | 16 | 29 | 45 |
| 41-50 | 52 | 51 | 103 | 9 | 22 | 31 |
| 51-60 | 41 | 57 | 98 | 16 | 8 | 24 |
| >60 | 49 | 53 | 102 | 9 | 12 | 21 |
| **Total** | **213** | **292** | **505** | **53** | **85** | **138** |

Total 643 adults (≥ 20 years) were screened; out of them 505 (78.5%) were from rural areas while 138 (21.5%) from urban areas. All participants by design were above 20 years of age as the diseases under screening are common only in adults. Half of the attendee (46%) were in the age group of 31 – 50 years. There were more female participants 377 (58.6%) than males 266 (41.4%). (Table 1)

**Table 2 : Prevalence of various disorders under study amongst camp attendee**

| | Rural | Urban | Total |
|---|---|---|---|
| **Population Screened** | **505** | **138** | **643** |
| **Hypertension** | | | |
| Pre hypertension | 158 (31.3) | 60 (43.5) | 218 (33.9) |
| **Hypertension** | 198 (39.2) | 47 (34.1) | 245 (38.1) |
| **Grade** | | | |
| stage I | 99 | 18 | 117 |
| stage II | 63 | 17 | 80 |
| Under treatment* | 36 | 12 | 48 |
| **Old vs. Newcases** | | | |
| Old | 85 | 21 | 106 |
| Newly detected | 113 | 26 | 139 |
| **Diabetes** | 128 (25.3) | 34 (24.6) | 162 (25.2) |
| RBS > 140 mg% | 118 | 29 | 147 |
| under treatment** | 10 | 5 | 15 |
| **Old vs. New cases** | | | |
| Old | 42 | 15 | 57 |
| New | 86 | 19 | 105 |
| **Overweight/ obese*** ** | 147 (29.1) | 53 (38.4) | 200 (31.1) |

Figure in parenthesis indicate prevalence rate per 100

* Include normotensive or pre hypertensive cases

** RBS was < 140 mg%

***BMI ≥30

Overall, prevalence of hypertension was 33.9% separately being high in rural (39.2%) than urban (34.1%) areas. Another one third of attendees (33.9%) were found suffering from pre hypertension. Suspected diabetes (RBS > 140 mg%) was seen amongst 25.2% of attendee with almost identical prevalence in rural and urban areas. About 31%of camp attendee had above normal BMI (overweight/obese); when viewed separately it was more common in urban (38.4%) than rural (29.1%). These camps in total could detect 105 new suspected cases of diabetes and 139 of hypertension; very few cases of diabetes reported, had the presence of classical symptoms of polydipsia (6), polyuria (4) and polyphagia (0). Same was true for hypertension where those who were symptomatic had headache and giddiness as common symptoms. (Table 2).

**Table 3: Prevalence rate (per 100) of diabetes and hypertension in various sub groups of camp attendee**

| | **Hypertension (N = 245)** | **Diabetes (type 2) (N = 162)** | **Statistical interpretation** |
|---|---|---|---|
| **Age (Years)** | | | |
| 21-30 (n = 104) | 9 (8.7) | 6 (5.8) | Hypertension- |
| 31-40 (n = 160) | 32 (20.0) | 24 (15.0) | X2 = 103.40, df = 4, |
| 41-50 (n = 134) | 65 (48.5) | 32 (23.9) | p< 0.0001 |
| 51-60 (n = 122) | 66 (54.1) | 48 (39.3) | Diabetes |
| >60 (n = 123) | 73 (59.3) | 52 (42.3) | X2 = 61.77, df = 4, p< 0.0001 |
| **Gender** | | | |
| Male (n = 266) | 113 (42.5) | 95 (35.7) | Hypertension- |
| Female (n = 377) | 132 (35.0) | 67 (17.8) | X2 = 3.69 , df = 1, p= 0.054 |
| | | | Diabetes |
| | | | X2 = 26.64, df = 1, p<0.0001 |
| **Nutritional status** | | | |
| Overweight/ obese (n = 200) | 106 (69.5) | 70 (35.0) | Hypertension- |
| Under/ normal weight (n = 443) | 139 (31.4) | 92 (20.8) | X2 = 27.32 , df = 1, p<0.0001 |
| | | | Diabetes |
| | | | X2 = 14.81, df = 1, p= 0.0001 |

Figure in parenthesis indicate prevalence rate per 1000 Prevalence of both hypertension and diabetes showed an increasing trend with increase in age in both the areas; differences when tested statistically were found highly significant. Prevalence rates were high for both diabetes and hypertension in males than females. While the difference for hypertension were statistically not significant (p <0.54), in case of diabetes, it was not only highly significant but also twice high in males than females. When viewed in relation of overweight/ obesity, prevalence of both disorders were significantly high in overweight/ obese persons than in under/ normal weight persons. Amongst obese persons prevalence of hypertension was alarmingly high (70%) (Table 3).

**Table 4 : Co existing morbidities among camp attendee (N = 643)**

| Category | No | Percent |
|---|---|---|
| Persons screened | 643 | 100.0 |
| Absence of all 3 morbidities (diabetes, hypertension, | | |
| Overweight/ Obesity | 260 | 40.4 |
| Diabetes alone | 44 | 6.8 |
| Hypertension alone | 91 | 14.2 |
| Overweight/ obesity alone | 71 | 11.0 |
| Hypertension and obesity | 59 | 9.2 |
| Diabetes and obesity | 23 | 3.6 |
| Diabetes and hypertension | 48 | 7.5 |
| Diabetes, hypertension and overweight/ obesity | 47 | 7.3 |

Table 4 shows the pattern of co-existing morbidities. Only 40% of attendee were free from all three morbidities and rest had any of three morbidities either in combination or in isolation. Some 60% of attendee had two or more disorders while 7.3% had all the three present in them.

**Discussion :**

Camp based approach has always been a matter of debate. It can at the most supplement the efforts of organized health system and no way can act as substitute of the system.[7] Here in this communication we discuss the effectiveness of organizing camps. Out of total 7 camps, only 2 were held in urban and rest in rural areas. Due to the availability during the day time, female participation was more in present study but elsewhere similar camps attracted more male participation.[4] Contrary to popular belief, prevalence of suspected hypertension and diabetes were marginally more in rural areas than in urban areas. It may be noted that the rural area in this study was also periurban in nature.

Obesity is an important public health problem and is increasing in both developed and developing countries with a varying prevalence between 10% and 40% indifferent countries.[8] Prevalence of overweight/ obesity in this study itself was high and was more so in urban areas. It is alarming that in urban areas every third camp attendee was either overweight or obese which can easily be linked with the dietary pattern and life style peculiar to urban areas. Early detection and timely institution of management of hypertension has tremendous benefits as lowering of blood pressure has been associated with 35% - 40% mean reduction in stroke incidence; 20-25% in myocardial infarction, high coronary disease risk.[6] Prevalence of suspected hypertension and diabetes (type 2) in present study were 38.1% and 25.2% respectively. Prevalence of hypertension was comparable with similar study in Jammu and Kashmir[1], but was much high when compared with prevalence of suspected diabetes. Additional 40.3% attendee (37.6% in rural & 50 % in urban) were pre hypertensive constituting an ideal group to be targeted with primordial/ primary prevention. As evident from the present study, it is worth knowing that diseases like hypertension and diabetes are no more confined to urban areas but are equally and at times more common in rural areas.

In the absence of a national screening program, innovative low cost method like camps [10] are needed to detect hidden asymptomatic cases of non-communicable diseases and promote awareness in rural and slum areas. 20 camps were conducted in Faridkot, Punjab, where 25 – 29% of attendee were found suffering from hypertension.[4]Camp approach enables us to detect such pre (potential) hypertensive who will rarely report at health facilities but with effective communication on preventive strategies can

be kept as normotensive and be spared from lifelong medication. These camps [7], organized with existing resources in present study, proved to be effective as additional 16% and 21% of attendee could be detected as suspected to be suffering from hypertension and diabetes respectively. Known yet uncontrolled cases of hypertension and diabetes detected in this study indicate poor treatment compliance and emphasize the role of camps in reinforcing the relevant knowledge to them which may improve their compliance. Some 60% attendee report two or more morbidities. It is common to see such morbidities [1, 5] as co-existing because the risk factors of all three disorders are common hence an integrated IEC can be developed and administered to the community during these camps as a cost effective intervention.

**Conclusions & recommendations :**

Logic of organizing such camps is based on the feasibility of camp approach in early detection of such disordersand the fact that they add to awareness generation about diseases/ their risk factors/ preventive measures. Organization of such camps in itself acts as good IEC. Manyattendee who do not suffer from diseases (s) and their accompanying friends/ relatives took keen interest in IEC messages displayed at camp sites. Camp based strategy is useful provided it is (1) preceded by an intensive community mobilization and (2) supported by good referral services honoured by the hospital for further work out and management. Hence it requires team work and coordination with different agencies involved. Selective and limited participation of male population in camps restricts their utility and such male population needs to be addressed by some alternative mechanism.

**Limitations:** Findings of this report elementary in nature, no way represent the population of the areas, hence need cautious interpretation. As prevalence is not a true one, denominator is total attendees. However in general they provide useful information about the load of hypertension, diabetes and obesity in the community and another crucial information that these non communicable diseases often associated with modern life style seen more in urban areas are equally (if not more) prevalent in rural areas as well.

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# Assessment of Immunization Status among Children aged 12-23 months, at an Urban Slum Area of Jagdalpur City, Bastar

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**Abstract :**

**Introduction :** Urban slums are high risk areas vulnerable for communicable diseases transmission, including paediatric age group communicable diseases such as T.B., Diphtheria, Pertussis, Tetanus, Measles and Poliomyelitis. The condition is much dire in Chhattisgarh where immunization coverage is below 59%. The majority population of present study area is either residing in slum or tribal areas. Immunization can reduce the incidence of vaccine preventable diseases by 95% in developing countries. **Objective :** 1. To assess the immunization status.2.To identify the predictors of partial and unimmunized status. **Method :** Present study was carried out in urban slums of Jagdalpur city. A coverage evaluation survey was done among children aged 12 - 23 month, using W.H.O. 30 cluster survey methodology. **Results :** On data analysis, it was observed that 55.1% children were fully immunized and 30.7% were partially immunized. Predictor factors were found to be significantly associated with unimmunized and partially immunized status of children. Dropout rates for measles compared to BCG & DPT1 were 11.8% and 2.1% respectively. **Conclusions :** Though immunization has been core component of human rights, present study observed many newborns are deprived of the immediate right they ought to get just after birth and also observed dropout rate which shows need of effective surveillance and tracking system.

**Key words :** Immunization, Urban & Slum, Dropout rate, Predictors

## Introduction :

Immunizations have reduced the incidence of vaccine-preventable diseases by 95% for every pediatric vaccine recommended for routine use before 1990. Moreover is a highly cost effective way of improving survival in children in developing countries. [1,2]

Despite global commitment, approximately 27 million infants worldwide were unimmunized against common childhood diseases and 2-3 million children died [3] of vaccine preventable diseases in 2007. In India condition is no different, as every 20$^{th}$ child is unable to celebrate his/her 5$^{th}$ birthday. According to the National Family Health Survey (NFHS-3), in India, only 44% off children aged 1-2 years have received the basic package of immunization which further improved to 61% (DLHS-3). This endeavor is still much less than the desired goal of achieving 85% coverage. [4]

The condition is much dire in the "Empowered Action Groups (EAG)" states like Chhattisgarh, where immunization coverage is well below 59% and condition further compromised with geographical inaccessible areas like tribal belt and mushrooming slum areas. [5] Slums are high-risk areas vulnerable for communicable disease transmission and about 25% of the Indian urban poor currently live in slums. Maternal and child health indicators among slum people show that their health is 2-3 times worse than those of people living in other urban areas. [6]

The carved out state has 37% of tribal population [4] with dual problem of ignorance and lack of quality health facilities. Dearth of evidences from the area regarding immunization coverage reduces the opportunity to take formative decisions. Hence the present study was planned to assess the immunization status and to identify the predictors of partial and non immunization.

**Method :**

Present cross sectional study was carried out in Jagdalpur city which is under field practice area of Department of Community Medicine, Government Medical College, Jagdalpur. A coverage evaluation survey was done from October 2013 to February 2014 among children aged 12-23 months in the urban slums of Jagdalpur city, using the WHO 30-cluster survey methodology. [7] Clusters were selected with probability proportional to the survey estimate of the community population size, by sampling frame of the 42 wards. [8] A totals of seven children aged 12 to 23 months were interviewed from each cluster.

Although the sampling unit was the individual subject, the sampling was conducted at the household level. The subjects were chosen by selecting a household and every eligible subject in the household was included in the sample. Only those respondents who were residing in the area for the last 6 months or more were included in the study. After taking informed consent from parent or caregiver pre-tested structured questionnaire was used to elicit the information. Information was collected on the various socio-demographic factors. Institutional ethical clearance was obtained before initiating the study.

**Selection of Clusters :**

A list of all the 42 wards with their population was procured and arranged in cumulative frequency. A cluster interval of 2984 was obtained by dividing the total population by 30 (No. of clusters). To obtain the first random number, a random number less than the cluster interval was generated with the help of random number tables which came out to be 387. The first cluster having a cumulative frequency equal to or more than 387 was picked up as the first cluster and subsequent clusters were selected by adding the cluster interval (2984), that is, (387+2984=3371). The cluster having a cumulative frequency equal to or more than 3371 was the second cluster. Thus, in this manner, 30 clusters were selected. Since clusters are selected with probability proportional to estimated size, households are selected with approximately equal (but unknown) probability, an all eligible children in a household are selected, the overall probability of any child being selected is roughly equal, and the design is approximately self-weighting (no weighting is needed in the analysis), i.e. each child in Jagdalpur had the same chance of being sampled.

A random direction was chosen from the midpoint of the settlement and a dwelling was chosen at random among those along the line from the centre to the edge of the community. Starting from this first household in each cluster, interviewers moved from house to house in a predetermined manner, stopping at every house until a minimum of seven children of the appropriate age were found for each cluster. All children in the household in the age range 12-23 months were included and the mother or caregiver interviewed. In the case of multi-dwelling households, all dwellings were visited. If, at the final house, there were more children than required, they were nonetheless included in the sample.

The method used for determination of the vaccination status was the vaccination card and the recall method. The primary respondent was the mother of the child; and in case of her absence, the father acted as the next respondent. In case of absence of both of them, an adult in the household who remained with the child for most of the time or had taken the child for immunization on at least one occasion was interviewed. The child was considered as fully immunized if he/she had received one dose each of BCG and measles and three doses each of DPT and polio (excluding Polio 0 dose) by his/her first birthday. Those who had missed any one vaccine out of the six primary vaccines were described as partially immunized, and those children who had not received any vaccine up to 12 months of age were defined as unimmunized. [9] The Overall dropout rate was the percentage point difference between the vaccines of the maximum and the minimum antigen received, expressed as a percentage of the maximum dose.

Statistical analysis was done by using the software SPSS 18. A p-value of $<0.05$ was considered significant. Bivariate analysis and multinomial logistic regression analyses were performed with immunization status as the dependent variable and the risk factors as independent variables. Multinomial logistic regression analysis was used because it attempts to remove the confounding effect of the independent variables on each other and thus finds out the independent association of each independent variable with the dependent one.

**Table 1: Immunization coverage with background characteristics***

| Variable | | Unimmunized | Partial Immunization | Complete Immunization | P-Value |
|---|---|---|---|---|---|
| Sex | Male | 16(13.3) | 36(30.0) | 68(56.7) | 0.86 |
| | Female | 16(15.2) | 33(31.4) | 56(53.3) | |
| Age of Mother | <20 | 0 | 05(83.3) | 03(16.7) | 0.03 |
| | 20-24 | 06(10.7) | 18(32.1) | 32(57.1) | |
| | 25-29 | 10(10.8) | 27(29.0) | 56(60.2) | |
| | >30 | 16(23.5) | 19(28.0) | 33(48.5) | |
| Mother Occupation | Labourer | 02(17) | 06(50) | 04(33) | 0.739 |
| | Homemaker | 27(13.7) | 59(30.0) | 111(56.3) | |
| | Business | 01(12.5) | 02(25.5) | 05(62.5) | |
| | Others | 02(25) | 02(25) | 04(50) | |
| Type of Family | Joint | 15(11.5) | 32(24.6) | 83(63.8) | 0.008 |
| | Nuclear | 17(17.9) | 37(38.9) | 41(43.2) | |
| Ration Card | Antodayee/BPL | 21(32.8) | 15(23.4) | 28(43.8) | 0.001 |
| | APL | 11(6.8) | 54(33.5) | 96(59.6) | |
| ANC Care | Not Received | 04(40) | 04(40) | 02(20) | 0.004 |
| | Partial Care | 03(18.8) | 09(56.3) | 04(25) | |
| | Complete Care | 25(12.6) | 56(28.1) | 118(59.3) | |
| Place of Delivery | Home | 09(24.3) | 12(32.4) | 16 | 0.003 |
| | Government | 16(13.2) | 46(38) | 59(48.8) | |
| | Private/Other | 07(10.4) | 11(16.4) | 49(73.1) | |
| Birth Order | 1 | 09(9.7) | 30(32.2) | 54(58.1) | 0.013 |
| | 2 | 15(16.0) | 30(32) | 49(52) | |
| | 3 | 02(7.7) | 07(27) | 17(65.3) | |
| | ≥ 4 | 06(50) | 02(17.5) | 04(33.5) | |
| Immunization | Present | 24(12.4) | 57(29.5) | 112(58.1) | 0.05 |
| | | | | | |

*Figures in the parenthesis shows percentages

**Results:**

In the 30 clusters, a total of 1585 households were surveyed to assess primary immunization coverage. A total of 225 children, aged 12 to 23 months were included of which 53.3% were males and 46.7% were females. It was found that 55.1% children were fully immunized against all the six vaccine preventable diseases & 30.7% were partially immunized. Regarding individual vaccine coverage in children, the coverage was highest for BCG (95.67%) and lowest for measles (84.4%), and for DPT3, OPV3, and HBV3, it was 86.2%, 86.2% and 60.0% respectively. On bivariate analysis, factors like mother's age, type of family, ration card, ANC care obtained, place of delivery, birth order and presence of immunization card were found to be significantly associated with unimmunization & partially immunized status of children (Table-1).

**Table 2: Dropout rates according to vaccines among vaccines in Jagdalpur City**

| Vaccines | | Drop Out (%) |
|---|---|---|
| **DPT/OPV** | I - II | 4.9 |
| | II - III | 5.0 |
| | I - III | 8.9 |
| **DPT-3 - Measles** | | 2.1 |
| **BCG - Measles** | | 11.8 |

A consistent decline in coverage rate from the first to the third dose was observed in DPT and OPV. Combined dropout rate for both DPT and OPV from the first to the third dose was 4.9 and 8.9%, respectively. The dropout rates for measles compared to BCG and DPT3 were 11.8 and 2.1%, respectively (Table-2)

**Table 3: Multinomial Logistic Regression analysis of predictors of Partial and Unimmunized status of Children**

| Predictor | Immunization Status | β coefficient | Odds Ratio | Class Interval | P-value |
|---|---|---|---|---|---|
| **Age of Mother** (20-24=0, <20=1, 25-29=2, >30=3) | Partial Immunized | 0.323 | 1.57 | 0.83-2.2 | 0.210 |
| | Unimmunized | 0.245 | 1.56 | 0.53-1.14 | 0.211 |
| **Type of Family** (Nuclear=0, Joint=1) | Partial Immunized | 0.227 | 0.221 | 0.4-3.2 | 0.638 |
| | Unimmunized | 0.693 | 4.52 | 1.1-3.8 | 0.034 |
| **Ration Card** (APL(Above Poverty Line)=0, BPL(Below Poverty Line) /Antodayee=1) | Partial Immunized | -0.793 | 15.7 | 0.36-0.67 | 0.000 |
| | Unimmunized | 0.176 | 1.14 | 0.86-1.7 | 0.286 |
| **Antenatal Women** (Complete=0, Partial=1, Not received any=2) | Partial Immunized | -0.783 | 2.5 | 0.17-1.2 | 0.118 |
| | Unimmunized | -0.849 | 4.3 | 0.19-0.95 | 0.038 |
| **Place of Delivery** (Govt=0, Home=1, Pvt/Other=2) | Partial Immunized | -0.645 | 3.6 | 0.27-1.01 | 0.05 |
| | Unimmunized | -0.358 | 2.1 | 4.3-1.14 | 0.152 |
| **Birth Order** (1st=0, 2nd=1, 3rd=2, ≥4=3) | Partial Immunized | 0.247 | 1.3 | 0.84-1.94 | 0.248 |
| | Unimmunized | 0.028 | 0.02 | 0.71-1.49 | 0.882 |

To find out the significant independent predictors of partial immunization of the child, multinomial logistic regression analysis was done, which revealed that ration card families (Antodayee families) and place of delivery (Home) as significant. Whereas for unimmunization type of family (Joint Family), ANC care obtained found to be significant predictors (Table-3).

**Table 4 : Incidence of Morbidities among children in last 15 days***

| Immunization Status | ARI | | Diarrhoea | | Fever | |
|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female |
| **Unimmunized** | 02(6.6) | 30(93.4) | 11(34.4) | 21(65.6) | 07(28) | 25(72) |
| **Partial Immunization** | 20(28.9) | 49(71.1) | 42(69.8) | 27(30.2) | 24(34.8) | 45(65.2) |
| **Complete Immunization** | 23(18.6) | 101(81.4) | 38(30.4) | 86(69.6) | 32(25.8) | 92(74.2) |

*Figures in the parenthesis shows percentages

When we observed incidence of diarrhoea found to be significantly associated with partial immunization status ($p<0.05$) whereas other morbidities (ARI & Fever) though they were higher among unimmunized and partially immunized children but found to be non significant (Table-4).

**Discussion :**

"30" clusters survey is proven tool to evaluate immunization coverage within shortest duration. Moreover it's cheap and cost-effective. Present study was conducted in the tribal belt of Chhattisgarh, where we observed complete immunization coverage of 55.1% among 12-23 months of children. This finding is comparable to the Coverage Evaluation Survey (CES) observations which identify coverage of 59% in the area but still lag far behind national goal. The coverage of BCG was higher (95.6%) than in the NFHS-3 for Chhattisgarh [4] (85%) and DLHS-3 [10] (94.8%). The higher coverage of BCG might be because of more institutional deliveries and the study area being near to the city. Similar to BCG, the coverage of OPV3, DPT3 and measles was also higher in the present study than in the NFHS-3 for Chhattisgarh and comparable with DLHS-3. The coverage for all vaccinations was found to be increased over a period of time, indicating a move toward universal immunization. A disturbing fact in the immunization process is dropout rate, which was observed 8.9% for DPT I to DPT III. Whereas overall dropout rate was 11.8% which is far less than observation by Sharma et. al. [11] at the slum area of Surat city. However, these studies had used a different methodology instead of the WHO 30-cluster survey methodology and thus had different results. Gupta et. al. documented 11.1% of the dropout rate in a '30' cluster survey in the urban slum area of Pune which is comparable to the present study findings. [12] The problem of dropout has different program-related implications as compared to the unimmunized group. It reflects lacunae in the health system and the opportunities missed.

In our study we identified important predictors of unimmunization to be family type and ANC care obtained to the mother. A joint family was four times at risk of having an unimmunized child because the decision of many family members for immunization like father, mother in law and care giver at home as compared to the nuclear family in which decision is less for unimmunization. These findings are consistent with those of Kar et. al.[13]

Similarly for partial immunization coverage, home deliveries and children from BPL families were found to be significant predictors. Children born at homes were found to be 3 times more prone for partial immunization as compared to the institutional deliveries. This particularly enlightens the cultural practices in the state where home deliveries are one of the highest in the country. Mothers, who deliver at home may be non-users of health services in general and have to be targeted for utilization of health services. Present study identified presence of the high birth order as independent predictors of unimmunization which are consistent with Nath et. al. [14]

**Limitations :**

The authors tried best to minimize the recall bias by confirming and reconfirming the immunization status by enquiring about the various aspects of the vaccine, such as name, site and age of administration; but as it is with any other study, it could not be totally eliminated. The authors could

also not study the inadequacies related to the health care delivery, cultural & behavioural aspect which have also been found to be responsible for the low immunization coverage, due to the paucity of resources and time.

**Conclusion :**

Though immunization has been core component of human rights still present study observed many newborns are deprived of the immediate right they ought to get just after birth. We identified substantial drop out rate which shows need of effective surveillance and tracking system. As technological advances opening new innovations its opportunity to introduce multivalent vaccines in the routine immunization program.

Urban slum population is disadvantaged with lack of public health care facilities, social amenities & poor environmental conditions. Hence it's pre-requisite to identify the pockets of compromised and inaccessible areas and should be addressed. Further factors identified as poor ANC care, home deliveries and high birth rate can be minimized through maternal tracking system once she registered for pregnancy and should be continued till completion of her family. A female in the family should be linked with family health as 'F to F Approach - Female to Family'.

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# Awareness and Practices on Menstrual Hygiene Amongst Adolescent Girls in Rajkot District of Gujarat

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**Abstract :**

**Introduction :** The knowledge established about the physiology of menstruation and unhygienic practises at adolescent age of girls predispose them to life threatening reproductive tract infections, infertility and various menstruation related morbidity conditions. And the same knowledge and practise is usually followed by them throughout life and also passed on to the next generations. **Objective :** To study the knowledge about physiology of menstruation and related problems. To study the level of awareness about safe menstrual hygienic practices. **Method :** A cross sectional study was done amongst 400 adolescent girls (school going and non school going but attending (Anganwadi Centre) from 4 villages of Rajkot district. Villages were selected randomly through multistage sampling technique. **Results :** The mean age of respondent in the study was 14.90+-2.90 years. Majority of school going girls were educated between 9 to 11$^{th}$ standard. 73.25% girls were using clothes while 26.75% were using sanitary napkin. Physiology of menstruation was known to only 5.7% of school going girls. Source of bleeding was known to only 24% girls. Correct Knowledge about the age of menarche was present amongst 83.50% study girls. 99% girls practiced cleaning of genitals with water. Infection related awareness was present amongst 56.25% girls. **Conclusion :** Study results show that there is poor knowledge about physiology of menstruation source of bleeding at the time of menstrual period and RTI/STI associated with poor hygiene practice. There is adequate knowledge regarding age of menarche and menstrual hygiene practice is good.

**Key words :** Menstrual Hygiene practices, RTI (Reproductive tract infections)

## Introduction :

The menstrual period is a physiological process that occurs throughout the reproductive years of every woman [1, 2]. This process is associated with various mental as well as physical morbidities like premenstrual syndrome. Menstruation can also predispose women to life threatening RTI (Reproductive Tract Infection) if hygiene is not maintained throughout menstruation.

Issue of "Menstrual Hygiene" begins with initiation of menstruation. The practices, knowledge and attitude which develop at adolescent age, are usually followed by them throughout their life and also passed on to their next generation. Therefore any faulty belief or practice pertaining to menstruation will affect health of large number of women in reproductive age group. Usually adolescent girls are guided by their mother, elder sister or other family members regarding menstrual hygiene practices. So, knowledge and beliefs of mother as well as other female family members regarding the menstrual hygiene in adolescents are important determinants. Menstrual hygiene practices also vary in rural and urban areas. In Indian culture, talking about reproductive function of body is considered taboo. Young females have poor knowledge and lack of awareness about physical and physiological changes associated with the onset and presence of adolescence. They hardly get any chance to learn about menstruation. Various myths and social beliefs are also prevailing to menstruation. Most girls are unaware about proper menstrual practices at the age of menarche [3].

Use of unhygienic cloths may lead to development of infection of reproductive tract which may seriously hamper the reproductive capacity or even life of female. Several research studies have

revealed gap between facts and beliefs of adolescent girls and showed that there is low level of awareness about menstruation among girls when they first experience it.[3] Therefore there is a need for implementation of appropriate public health measures at various levels to generate awareness about safe menstrual hygiene practices among adolescent girls for the prevention of RTI and future complications.

Present study was conducted in four talukas of Rajkot district. The present study was conducted with the objectives to assess knowledge regarding menstruation and menstrual hygiene practices prevalent in these areas among adolescent girls.

**Method :**

A cross sectional study was carried out in Rajkot district by Community Medicine Department of P. D. U. Govt. Medical College, Rajkot during the month of February and March 2014. The sample size was calculated as 400 by the formula $4pq/l^2$, where p is taken as 0.5, assuming that 50% of the adolescent girls were having correct knowledge and practice regarding menstruation. Further sample was proportionately divided into 280 (70%) for school going adolescent and 120 (30%) out of school going adolescent based on the 70% girls are enrolled in higher secondary schools (as per DLHS-3). The sampling was done using multi-stage sampling method.

| | |
|---|---|
| **First Stage** | • District was divided in four zone<br>• From each zone one taluka was selected randomly by lottery method |
| **Second Stage** | • From each selected taluka, list of the villages was obtained and one village from each taluka was randomly selected by lottery method<br>• From each village 100 participants were taken to complete 400 samples size. |
| **Third Stage** | • From each village 70 adolescent girls studying in school and 30 non school going girls registered in Anganwadi were selected for study |

A pre formed, pre tested semi-structured questionnaire was used for data collection after piloting. A questionnaire was distributed to the girls in school and asked to fill the Performa while, adolescent girls from Anganwadi centres were interviewed for the data collection by field investigators. Informed consent was taken from the Principal in case study at school and from parents/guardian selected from the Anganwadi centres. The data entry was done in Microsoft Office Excel 2007 and data analysis in Epi info 7.0

**Results :**

**Table 1: Socio-demographic profile of study participants**

| Socio-demographic variables | Frequency | % |
|---|---|---|
| **Age in years** | | |
| 13 | 65 | 16.25 |
| 14 | 118 | 29.50 |
| 15 | 90 | 22.50 |
| 16 | 66 | 16.50 |
| 17 | 43 | 10.75 |
| 18 | 11 | 02.75 |
| 19 | 7 | 01.75 |
| **School going** | | |
| Yes | 280 | 70.00 |
| No | 120 | 30.00 |
| **Standard** | | |
| 9 | 177 | 63.22 |
| 10 | 8 | 02.86 |
| 11 | 95 | 33.93 |
| 12 | - | - |
| Total | 280 | 100 |
| **Religion** | | |
| Hindu | 375 | 93.75 |
| Muslim | 25 | 06.25 |
| Christian | - | - |
| **Caste** | | |
| General | 92 | 23.00 |
| SC | 80 | 20.00 |
| SEBC (OBC) | 220 | 55.00 |
| ST | 8 | 02.00 |
| **Type of Family** | | |
| Joint | 78 | 19.50 |
| Nuclear | 251 | 62.75 |
| Three Generation | 71 | 17.75 |
| **Total** | 400 | 100.00 |

As shown in table 1, the study included 280 school going and 120 non-school going adolescent girls of 13-19 years age group. Mean age of participants was 14.90 ± 2.90 yrs. Most (93.75%) of the girls were Hindu and majority of participants (62.75%) belonged to nuclear family.

**Table 2 : Knowledge of participants regarding menstruation**

| **Variables regarding knowledge** | **n** | **%** |
|---|---|---|
| **Age of menarche (n=400)** | | |
| 10 to 15 Years | 334 | 83.50 |
| >15 Years | 13 | 03.25 |
| Don't Know | 53 | 13.25 |
| **Source of menstrual blood (n=400)** | | |
| Abdomen | 8 | 02.00 |
| Intestine | 3 | 00.75 |
| Uterus | 96 | 24.00 |
| Don't know | 293 | 73.25 |
| **Knowledge about physiology of menstruation(n=400)** | | |
| Disposal of bad blood | 193 | 48.25 |
| Change in hormonal level | 22 | 05.50 |
| Weight gain | 3 | 00.75 |
| Don't know | 182 | 45.50 |
| **Awareness about sanitary Napkin** | 291 | 72.75 |
| **Source of information** | **(n=291)** | |
| Mother | 87 | 29.90 |
| Sister | 42 | 14.43 |
| Friend | 60 | 20.62 |
| Media | 65 | 22.34 |
| ASHA | 0 | 00.00 |
| Other | 37 | 12.71 |
| **Received information regarding menstruation(n=400)** | 276 | 69.00 |
| **Place of information given regarding menstruation** | **(n=276)** | |
| School | 150 | 54.35 |
| Home | 113 | 40.92 |
| Anganwadi | - | - |
| Other | 13 | 04.71 |
| **Source of information regarding menstruation** | **(n=276)** | |
| Teacher | 139 | 50.36 |
| Mother | 98 | 35.51 |
| Health provider | 16 | 05.80 |
| Other | 23 | 08.33 |

In Rajkot district, 83.50% of girls had correct knowledge regarding age of menarche (table 2) and only 24.00% girls knew about source of menstrual bleeding. The physiology of the menstruation was correctly answered by only 5.7% of school going adolescent girls.The awareness regarding sanitary napkin was in almost 3/4$^{th}$ of the girls of the district with the major source of knowledge being mother (29.9%), media (22.34%) and friend (20.62%). Out of 276 girls who received information regarding menstruation, major sources of information were teachers (50.36%) and mothers (35.51%).

**Table 3: Comparison of knowledge among school going and non-school going adolescent girls**

| Sr. No | Knowledge | Overall | School Going | Non-school going | SEP Z value |
|---|---|---|---|---|---|
| 1 | Source of Menstrual Blood | 96 (24%) | 82 (29.29%) | 14 (11.67%) | 3.47 |
| 2 | Physiology of Menstruation | 16 (04%) | 16 (5.71%) | 00 | 2.70 |
| 3 | Age of Menarche | 334 (83.5%) | 263(93.93%) | 71 (59.17%) | 6.97 |
| 4 | Relation between menstruation and pregnancy | 169 (42.25%) | 137 (48.93%) | 32 (26.67%) | 3.65 |
| 5 | Anaemia due to loss of blood in MC | 60 (15.0%) | 49 (17.5%) | 11(9.17%) | 0.35 |
| 6 | Occurrence of Infection During MC if Hygiene is poor | 225 (56.25) | 182 (65.0%) | 43(35.83%) | 4.72 |

As per table 3, the knowledge regarding source of menstrual blood was more among school going girls (29.3%) as compared to non-school going girls (11.7%) in Rajkot district. The relationship between menstrual cycle and pregnancy was known to almost half of the school going girls while in non-school going girls, only 26% were aware about it. Anaemia may occur due to loss of blood in menstrual cycle was known equally among school going as well as non-school going girls.

**Table 4 : Menstrual hygiene practices during last menstruation**

| Variables | Rajkot | | | |
|---|---|---|---|---|
| **Absorbent used during last menstruation** | | | | |
| Cloth | 293 (73.3%) | | | |
| Sanitary Napkin | 107 (26.7%) | | | |
| **Cleaning genitals(n=400)** | 395 (98.8%) | | | |
| **Method of cleaning genitals** | | | | |
| Soap water | 134 (33.9%) | | | |
| Water | 240 (60.8%) | | | |
| Antiseptic | 19 (04.8%) | | | |
| Other | 02 (00.5%) | | | |
| | | | | |
| **Which type of problem** (Problems faced with the adsorbents) | | | | |
| | Cloth | | Sanitary Napkin | |
| | N | % | n | % |
| Itching | 12 | 44.44 | 3 | 60.00 |

| | | | | |
|---|---|---|---|---|
| Ill Fitting | - | - | - | - |
| Staining on Cloths | - | - | - | - |
| Rashes | 12 | 44.44 | 1 | 20.00 |
| Other | 3 | 11.11 | 1 | 20.00 |
| Total | 27 | 09.22 | 5 | 04.67 |
| **Method of disposal** | | | | |
| Dustbin & Burning | 256 | 87.37 | 104 | 97.20 |
| Toilet | 37 | 12.63 | 3 | 02.80 |
| Other* | - | - | - | - |
| **Total** | 293 | 100.00 | 107 | 100.00 |

***Others included washing and burial for cloths and sanitary pad, respectively.**

Table 4 shows that in Rajkot district, 293 girls had used Cloth and 107 girls had used Sanitary Napkin during last menstrual cycle. Nearly 99% girls were cleaning genitals during menstruation and most of them (>95%) were using plain water or soap with water to clean the genitals. The most common problems faced with cloth as absorbent were itching and rashes while itching was the major complain while using sanitary napkin as an absorbent. The method of disposal used was through dustbin and burning in 87.4% of those using cloth as absorbent and 97.2% in those using sanitary napkins.

**Table 5: Association between absorbents used by participants and their mothers**

| **Absorbent used by Participants** | **Absorbent used by mother** | | **Total** |
|---|---|---|---|
| | **Cloth** | **Sanitary napkin** | |
| **Cloth** | 254(99.22) | 2(00.79) | 256 (100.0) |
| **Sanitary napkin** | 54(65.86) | 28(34.15) | 082 (100.0) |
| **Total** | 308 (91.12) | 30 (08.88) | 338 (100.0) |
| | **Chi square value 85.48, *P* value<0.0001** | | |

Statistically significant association was found between the absorbent used by the mother and study participants. It indicates that there were all chances that same types of the adsorbent were used by the adolescent girls, which were used by their mothers.

**Discussion :**

In most of the Indian traditional societies, open discussion in public on a topic like process of Menstruation and its related health problems, is considered as a taboo and it is often discouraged. This leads to lack of proper knowledge and affects safe practice of menstrual hygiene in adolescent girls and also pose them to the risk of anxiety, reproductive infections as well as pregnancy related issues.

In the present study, an effort has been made to assess the correct knowledge regarding physiology of menstruation and safe menstrual hygiene practices amongst adolescent girls of rural and urban areas of Rajkot district.

The mean age of participants was 14.90±2.90 and 83.50% had adequate Knowledge regarding age of menarche this study.

In the present study 24 % girls were having adequate knowledge about source of bleeding during menstruation and results are similar to a study done in Uttarakhand in which 29.1% girls had correct knowledge.[4] While 40% girls showed the correct knowledge in another study conducted by Jasrotia RB

and Kanchan A. [8] But a study done in Nagpur city, only 2.5% girls stated that menstrual bleeding come from uterus.[5]

It was observed in our study that only 4% of girls believed that menstruation is a physiological process. The result is similar to the findings of the study done by Mudey AB et al. in which most of the girls out of 300 had poor knowledge about the same. [6] The reason may be that the issue is not frequently discussed at home or schools. But in the studies conducted by Jasrotia RB et al. and Das guptaAet al. a significant proportion of girls 74% and 86.25% respectively considered it as a Physiological process. [8,9]

It was seen that the knowledge regarding relation of menstruation and pregnancy was present in 42.25% girls as compare to 35.8% adolescent girls of Kheda district. [10]

The study reveals that most of (73%) the girls used cloth during menstruation. The reason may be lack of awareness or low socioeconomic status. The findings were consistent with the other study done by Thakre SB in Nagpur. [5] Government Of Gujarat has launched a program in Kheda district where Sanitary Napkin are being provided at subsidized rate through schools , so use of cloth was less 61% in Kheda as compared to Rajkot district. [11]

The use of SN in last MC was 27% in our study while 38.4% in a study done by Juyal R et al. [4] The above observation may be due to lack of proper health education program in school which focuses on the menstrual health and hygiene among girls. 39% girls were using sanitary napkin in Kheda[11] and in a study by Shanbhag D et al. it was seen that 44.1% used sanitary napkin. [7]

Personal hygiene during menstruation was variable in different studies. In present study 99% girls were cleaning their genitals properly as compare to 95% in Kheda. [11] Similar result was seen in a study by Juyal R et al. in which the result was 94%. [4] In other study only 59.33% girls maintain their personal hygiene during menstruation. [6]

9.22% girls using cloths faced problems like infection or itching during menstruation in present study as compare to 66% girls in Kheda district. [11] Similarly most of the girls developed infection and complained of white discharge, itching and burning micturition during their periods in a study by Mudey AB et al. [6] As we know that cloth users are more prone to develop genital tract infection; 65.70% respondent developed infections in a study done in Rajasthan state that there is strong and significantly relationship between RTI and hygiene practice during menstrual cycle. [12]

In a study done in Rajasthan In above study the commonly used method of disposal of used absorbent is dustbin or burning 93% which goes in common solid waste disposal. [12] In study conducted by Thakre SB et al. common practice was wrapping in paper and disposing in dust been or burning it. The same findings were reported by other studies. [13-16]

**Conclusion and Recommendations :**

The knowledge regarding the various aspects of menstruation is poor, especially among non-school going girls. Majority of adolescent females still follow the practice of usage of cloth as an absorbent for menstrual blood. They are unaware of proper disposal techniques of sanitary pad or other material used as absorbent which may promote various communicable diseases among themselves as well as in the community. Stringent efforts are required to promote the menstrual hygiene practices among rural females. ANM and ASHA could be important source for promoting Menstrual Hygiene related awareness and practices, but it is required to ensure proper actions by both ANM & ASHA for effective implementation. Mothers and elder sisters are playing important part in the hygienic practice during menstruation among girls; especially in out of school adolescent girls; so inter-personal communication sessions of the Mothers must be arranged along with adolescent girls at Anganwadi centers or in the schools. Impact of television, local channels, radio as well as Newspaper and pamphlets in increasing the awareness about use of Sanitary Napkin is observed and that should be used for mass campaign. The findings of the study can be utilized for making new policies and planning programs for improving the menstrual hygiene of adolescent girls especially of rural areas.

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# Study of Underlying Causes of Death in the admitted cases in V. S. General Hospital during the year 2014

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**Abstract :**

**Introduction :** Mortality statistics is essential for planning the health care delivery and welfare of the community. Medical Certification of Cause of Death (MCCD) in the hospital provides the trend and changing mortality pattern of various diseases. **Objectives :** (1) To study age wise distribution of total deaths of all patients admitted in Vadilal Sarabhai General Hospital (VSGH) during the year 2014. (2) To study the underlying cause of death in each case. **Method :** Retrospective study of Medical Records was carried out from the medical Record Section of the hospital from which all the 3262 recorded deaths during the year 2014 were included. **Results :** Mortality in males was 61% as compared to 39% female mortality. Commonest cause of death was the diseases of Circulatory system (18.6%) followed by Respiratory diseases(13.1%)and morbidity and mortality due to external causes(12.2%). Deaths due to infectious and parasitic diseases contributed 11.7% of total deaths. Amongst these, 55% of deaths were due to tuberculosis. Infant deaths were 351(10.8%)out of which 71% were observed in early neonatal period, followed by 8% in late neonatal period. Thus 79% of total infant deaths were in the neonatal period. Respiratory Distress of newborn (41.7%) and Birth Asphyxia (33.6%) were the leading causes of death in the early neonatal period. Low Birth Weight was attributable to 45(25.9%) of total neonatal deaths. **Conclusion :** Mortality statistics of the hospital would give us changing trend of the leading causes of deaths over the years and planning for the treatment of these diseases in the hospital.

**Key words :** Underlying Cause of death, Medical Records

## Introduction :

Mortality statistics is quite essential for welfare of the community and health planning. [1] It also helps in building up a scientific base for medical research as well as mortality status for medical professionals. Death certification is a public health surveillance tool and is very important because morbidity and mortality statistics often come from death certificate data [2]. Cause specific mortality rates are the key indicators of the health trends in the population and are provided on scientific basis by the system of Medical Certification of Cause of Death (MCCD). The MCCD scheme is basically a part of International Statistical Classification of Diseases and Related Health Problems (ICD) formulated by World Health Organization. It helps in assessing the effectiveness of public health programmes and provides a feedback for future policy and implementation. They are essential for better health planning and management for deciding priorities of health and medical research programmes. [1]

## Aims and objectives :

1) To study age wise distribution of total deaths of all patients admitted in Vadilal Sarabhai General Hospital (VSGH) during the year 2014,

2) To study the underlying cause of death in each case

## Method :

- **Study design :** Secondary Data Analysis (Retrospective study of Medical Records)
- **Period of Study :** May 2015 to September 2015
- **Sample size :** 3262 (all deaths)
- **Data Collection :** From Medical Record Section of VSGH

- **Inclusion criteria :** All deaths recorded at VSGH during the year 2014

International Classification of Diseases and Health Related Problems – 10th revision (ICD-10) has been used to classify the Underlying causes of death.

**Results :**

**Table 1 : Distribution of Mortality according to different Age groups (n=3262)**

| Age Group (Years) | Number of deaths | Percentage (%) |
|---|---|---|
| 0 to 1 | 351 | 10.8 |
| 1 to 4 | 50 | 1.5 |
| 5 to 14 | 51 | 1.5 |
| 15 to 24 | 252 | 7.7 |
| 25 to 34 | 332 | 10.1 |
| 35 to 44 | 330 | 10.1 |
| 45 to 54 | 519 | 15.9 |
| 55 to 64 | 561 | 17.2 |
| 65 to 74 | 488 | 15 |
| More than 74 | 328 | 10.1 |
| Total | 3262 | 100 |

As observed in table 1, during year 2014, total 3262 deaths were observed in VSGH, out of which 351(10.8%) were infant deaths and 1896(58.2 %)deaths were observed in the age group 45years and above. Highest number of deaths 561(17.2%) were seen in the age group of 55 years to 64 years. Mortality in males was 1995(61)% as compared to 1267(39%) female mortality. The higher mortality in males is due to higher admissions of the males in the hospital.

**Table 2: Month wise distribution of deaths in year 2014(n=3262)**

| Month | Numbers of deaths | Percentage (%) |
|---|---|---|
| January | 319 | 9.8 |
| February | 231 | 7.1 |
| March | 238 | 7.3 |
| April | 297 | 9.1 |
| May | 299 | 9.2 |
| June | 283 | 8.7 |
| July | 224 | 6.9 |
| August | 281 | 8.6 |
| September | 295 | 9.1 |
| October | 276 | 8.5 |
| November | 241 | 7.4 |
| December | 278 | 8.5 |
| Total | 3262 | 100 |

As seen in table 2, Maximum deaths were observed in month of January (9.8%), followed by deaths in the months of May (9.2%), April (9.1%) and September (9.1%)of year 2014. Small seasonal variations were observed due to some variations in the disease patterns and related mortality.

**Table 3 : Underlying Cause of Death according to the ICD -10 Codes during year 2014**

| Sr. No. | Disease Chapters /Blocks | ICD-10 code | Number of cases | Percentage (%) |
|---|---|---|---|---|
| 1 | Certain Infectious and parasitic diseases | A00-B99 | 380 | 11.7 |
| 2 | Neoplasms | C00-D48 | 42 | 1.3 |
| 3 | Diseases of blood & Blood forming organs | D50-D89 | 90 | 2.8 |
| 4 | Endocrine , nutritional and metabolic diseases | E00-E90 | 233 | 7.1 |
| 5 | Diseases of Nervous system | G00-G99 | 208 | 6.4 |
| 6 | Diseases of Circulatory system | I00-I99 | 605 | 18.6 |
| 7 | Diseases of Respiratory system | J00-J99 | 428 | 13.1 |

| | | | | |
|---|---|---|---|---|
| 8 | Diseases of Digestive system | K00-K93 | 289 | 8.9 |
| 9 | Diseases of musculoskeletal system and Connective tissue | M00-M99 | 09 | 0.3 |
| 10 | Diseases of Genitounrinary system | N00-N99 | 128 | 3.9 |
| 11 | Pregnancy , Childbirth and puerperium | O00-O99 | 25 | 0.7 |
| 12 | Certain conditions originating in Perinatal period | P00-P96 | 173 | 5.3 |
| 13 | Congenital malformations, Deformations and Chromosomal Abnormalities | Q00-Q99 | 21 | 0.6 |
| 14 | External causes of Morbidity and Mortality | V01-Y98 | 399 | 12.2 |
| 15 | Cause of Death pending | Not available | 232 | 7.1 |
| | Total | A00 - Y98 | 3262 | 100 |

As per table 3, Diseases of Circulatory system (I00-I94) ranked first as the cause of death and were responsible for 605 deaths(18.6%) of total deaths. Respiratory system diseases(J00-J99) were second leading cause of death and contributed 428 deaths(13.1%) of total deaths. Deaths due to External causes of morbidity and mortality (V00-Y98) ranked third and were responsible for 399(12.2%) of all deaths. Out of these 399 cases, Road Traffic Accidents(V01 toV98) were 179(44.9%). This was followed by infectious and parasitic diseases(A00-B99) which constituted 380(11.7%) and were the fourth leading cause of death. Diseases of digestive system (K00-K93) accounted for 289(8.9%) deaths and was the fifth leading cause. These five leading causes of death accounted for 2101(64.5%) of total deaths observed in the hospital in the year 2014.

Eventhough MCCD has been practised in the hospital since its inception, the cause of death was not recorded in the medical records of the deceased in 232deaths (7.1%) of the deaths. The reason for the same was that the cause of death was either ambiguous or was kept pending awaiting the Post Mortem (PM) report.

**Table 4 : Deaths due to common Infectious & Parasitic diseases ICD-10 codes (A00-B99) (n=380)**

| Sr. No. | Cause of death | ICD-10 code | Number of cases | Percentage (%) |
|---|---|---|---|---|
| 1 | Intestinal infectious diseases | A00-A09 | 07 | 1.9 |
| 2 | Tuberculosis | A15-A19 | 209 | 55.0 |
| 3 | Other Bacterial diseases | A30-A49 | 37 | 9.8 |
| 4 | Viral infections of central nervous system | A80-A89 | 29 | 7.6 |
| 5 | Dengue | A90-A91 | 11 | 2.9 |
| 6 | Viral Hepatitis | B15-B19 | 42 | 11.1 |
| 7 | HIV | B20-B24 | 08 | 2.2 |
| 8 | Mycoses | B35-B49 | 03 | 0.8 |
| 9 | Malaria | B50-B54 | 33 | 8.7 |
| | Total | A00 - B99 | 380 | 100 |

Table 4 shows the burden of the deaths due to infectious and parasitic diseases which accounted for 380(11.7%) of total deaths. Amongst these, tuberculosis mortality was 209 deaths (55%). This was followed by viral hepatitis 42(11.1%) and other bacterial infections 37(9.8%). Malaria was attributable in 8.7% of all deaths due to infections.

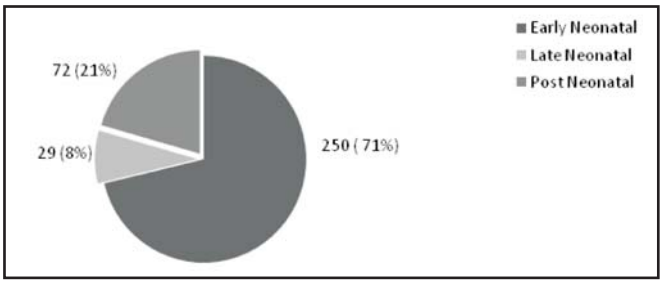
**Table 5 : Agewise distribution of total Infant Deaths (n=351)**

| Infant Mortality | Frequency | Percentage (%) |
|---|---|---|
| Less Than 1 day | 196 | 55.8 |
| 1 to 2 days | 15 | 4.3 |
| 2 to 7 days | 39 | 11.1 |
| 8 to 28 days | 29 | 8.3 |
| 29 days to 1 Year | 72 | 20.5 |
| Total Infant Deaths | 351 | 100 |

As observed in Table 5, Infant deaths constituted about 11% (351deaths) of total deaths and also have many determinants according to various phases of infancy; these deaths are classified in more details.

Higher mortality was bserved in Early Neonatal Period (upto 7 days) which accounted for 250 deaths (71%) of all infant deaths. Nearly 56%(196 deaths) of infant deaths were on the first day of life.

**Figure 1: Mortality in Infancy (Early, Late and Post Neonatal Period) (n=351)**




There were 351 infant deaths out of which 71% were observed in early neonatal period, followed by 8% in late neonatal period. Thus 79% of total infant deaths were in the neonatal period. The rest 21% deaths were seen in the post neonatal period. (Chart no.1 )

**Table 6 : Common causes of Deaths in Early and Late Neonatal Period. (n=174)**

| Neonatal period | Deaths occurring in 0 to 7 days (n=158 ) | Deaths occurring in 8 to 28 days(n= 16) |
|---|---|---|
| Respiratory Distress | 66 (41.7%) | 0 |
| Birth asphyxia | 53 (33.6%) | 0 |
| Respiratory infection | 0 | 10 (62.5%) |
| Low Birth Weight | 39 (24.7%) | 6 (37.5%) |
| Total | 158 (100%) | 16(100%) |

Table 6 shows, In the Early neonatal period, Respiratory Distress of newborn 66 deaths(41.7%) and Birth Asphyxia 53deaths (33.6%) were the leading causes of death, whereas Low Birth Weight (LBW) was the cause in 39 deaths(24.7%) . In the Late neonatal period, Respiratory infections were the cause of death in 10(62.5%) cases and LBW was attributable to 6(37.5%) of deaths .

**Discussion :**

MCCD report of 2012 shows gives the report of census 2011. This gives the leading causes of death (in groups) as follows: Diseases of Circulatory System constitute the maximum i.e. 30.3% of total medically certified deaths, followed by 'Certain Infectious and Parasitic Diseases (12.3%). The diseases of respiratory system have contributed to 8.4% of total medically certified deaths. The group of Injury, Poisoning and Certain other Consequences of External Causes constitute 7.7% of total medically certified deaths, followed by 6.9% due to Certain Conditions Originating in Perinatal Period. Neoplasms constitute 5.0% and Diseases of the Digestive System constitute 4.3% [3]. In the current study also the five leading causes of death were Circulatory system 605(18.6%) followed by Respiratory diseases 428(%), External causes of morbidities and mortality 399(12.2%), certain infectious and parasitic infections 380(11.7%) and 289(8.9%). Sexwise distribution of medically certified deaths shows that the percentages of male deaths ( M V/s F=62.1 : 37.9 )to total medically

certified deaths are on a higher side[3]. Similarly, in the present study also there were 1995(61% ) deaths in males and 1267(39%) in females recorded in this study also.

Among the Certain Infectious and Parasitic Diseases, Tuberculosis and Septicaemia constitute 34.7 per cent and 35.4 percent respectively as per the census data of 2011.[3] Tuberculosis, while no longer among the 10 leading causes of death in 2012, was still among the 15 leading causes, killing over 900 000 people in 2012.[4] In this study also Tuberculosis constituted about 55% of total deaths caused by Certain Infectious and parasitic Diseases.

Registrar General of India had carried out survey over all infant deaths that occurred in India during year 2001-2003. Three causes accounted for 78% of all neonatal deaths: prematurity and low birth weight, neonatal infections and birth asphyxia and birth trauma.[5] About 44% of deaths in children younger than 5 years in 2012 occurred within 28 days of birth – the neonatal period. [4] Similar results were seen in the present study also. There were 10.7% infant deaths out of which 71 % deaths were in early neonatal period and 8% in late neonatal period. The three common causes of these were Respiratory Distress, Birth asphyxia and LBW.

**Summary :**

A total of 3262 deaths were registered in VSGH during the year 2014. Higher percentage of mortality was observed in males (61%). Maximum number of deaths occurred in 55-64 year age group (19%).

Diseases of circulatory system were the leading cause of death accounting for 18.6% of all deaths followed by respiratory diseases(13.1%). Deaths due to external causes of mobidity and mortality were 399(12.2%). Infectious and parasitic diseases mortality ranked fourth with 11.7% of total deaths. Amongst all infectious diseases, mortality due to Tuberculosis was 55% , followed by Viral hepatitis(11.1%).

Neonatal deaths accounted for 79% of total infant deaths and majority of them (71%) were in the early neonatal period. The common causes of death were Respiratory Distress, Birth asphyxia and LBW.

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# Health Talk and Demonstration- an Effective Way of Communication among Rural Population

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**Introduction :**

In modern world non-communicable diseases are on the rise, but in rural areas of developing world communicable diseases continue to remain major public health problems. Most of these infectious diseases are because of poor sanitation and poor hygienic practices. Diarrhoeal disease is a major public health problem in developing countries like India. Of all infectious disorders, pneumonia, diarrhoea, and malaria were the leading causes of death worldwide during 2013.[1]

A third of the 2·5 billion people worldwide without access to improved sanitation live in India, two-thirds of the 1·1 billion practice open defecation and a quarter of the 1·5 million die annually from diarrhoeal diseases.[2] Diarrhoea is a leading cause of morbidity and mortality among children under five worldwide.[2] In India alone, it was estimated that there were 212,000 child deaths due to diarrhoea in the year of 2012-13.[1]

Oral Rehydration therapy is a well established form of therapy for the treatment of dehydration attributed to diarrhoea.[3] WHO continued to recommend Oral Rehydration Salt (ORS) packets for all cases of diarrhoea.[4] Still in rural India, people have poor knowledge regarding importance of ORS in diarrhoea and its preparation. Illiteracy plays a major role behind it. Talking about the importance of proper personal hygiene for preventing illnesses and providing personal hygiene items may help some people.[5] To teach these people about importance of sanitation, to bring them out from their older unhygienic practices and give them knowledge on healthy practices is not a simple task. For communicating with people of rural areas we should apply a method which is simple in language and easy to be understood by them. Health talk, role play, street play and demonstration are few of such methods. By these methods messages can be spread among community members in a simple way and in local language. Demonstration is a method in which people can understand message very easily simply by observation. People can even remember the message for longer period of time which they have observed as compared to the message which they heard. Doing demonstration of ORS preparation and giving health talk on its use in diarrhea plays a major role in improving knowledge. With this purpose a health talk and demonstration session was arranged in a rural village of central Gujarat.

**Aim of the Session**

To create awareness on use of ORS during diarrhoea

**Objectives of the Session**

1) To give health-talk on use of ORS during diarrhoea

2) To demonstrate how to prepare ORS solution

Primary Health Centre (PHC) Sokhada has been affiliated as Rural Health Training Centre (RHTC) with Community Medicine Department, Medical College Baroda since March 2013. Here interns are posted for one month training as a part of their compulsory rotatory internship posting. Along with routine OPD activities they also have to carry out field activities in different villages covered under RHTC Sokhada. Sokhada is a village with scattered clusters (faliya) having nearly 6000 population. Ramtekara is one of the clusters of Sokhada village where people reside in kuchha or semi-pakka houses and live in poor hygienic conditions. Most of them do not have toilets inside their house and practice open air defecation. Neither do they have clean drinking water supply nor do they have proper drainage system. Most of them are illiterate and have poor knowledge regarding hygienic practices, infectious diseases, their mode of transmission and their

treatment. This problem requires appropriate solution. Ramtekara, being a field practice area of Community Medicine Department, we conducted a session for improving their knowledge regarding health problems related to poor hygiene and on various diseases transmitted by feco-oral route. So, during "Intensified diarrhoea control fortnight", Lady Medical Officer of RHTC, Sokhada along with residents and interns students have given Health Talk and demonstrated ORS preparation to the rural community.

**Preparation and Performance :**

"Intensified Diarrhoea Control Fortnight" was celebrated from 27th July to 8th August, 2015. As a part of its celebration Rural Health Training Centre staff of Sokhada has decided to give heath talk to rural community. During these 15 days period, health talk was given at two different places in Sokhada village. In a Ramtekara faliya health talk was given by Lady Medical Officer and in a local school, it was given by Assistant Professor of RHTC Sokhada. During preparatory phase residents posted at RHTC along with interns visited whole village and selected this faliya near a temple, which was best suited for giving health talk. On August 4'2015, whole RHTC team reached at predefined place in a Ramtekara Faliya. All the people residing in that faliya were informed on previous day by interns and ASHA worker and also on the day of performance again we had a small walk in that area to gather all the people. When 60-70 peoples were gathered, we started giving health talk. As health talk was organized as a part of Intensified Diarrhoea Control Fortnight, content of our health talk included causes of diarrhoea, its sign and symptoms, treatment and its preventive measures. As a part of preventive measures water hygiene, nutritional hygiene, personal hygiene and importance of sanitation were explained to them. Special focus was given on sanitation barrier and use of sanitary latrine.

After giving health talk related to diarrhoea, we explained them the role of Oral Rehydration Solution (ORS) in prevention of dehydration, the major cause of morbidity and mortality associated with diarrhoea. Along with that we showed them different homemade preparation which can also be used as a supplement during dehydration. This was followed by one demonstration session of ORS preparation. Demonstration was carried out using their own utensils, so that they can measure 1 liter of water exactly using local utensils. Before preparing ORS solution 6 steps of hand washings were demonstrated to them. By this they came to know the importance of hand washing before preparing ORS or any other food. After preparing ORS, 1 teaspoon was given to each of them to taste it, so that they came to know about real taste of ORS when its concentration is as per requirement.

At the end of demonstration session, we checked peoples' understanding on the same. One by one we invited community members to repeat what they understand during whole session. One adolescent girl repeated all 6 steps of hand washing very well. One of the adult female representing whole groups again explained the importance of ORS in diarrhoea and sanitation.

**Feedback from community members :**

At the end of health talk and demonstration sessions, we invited community members to give their feedback. One of the male members, quiet educated, one like a leader of that community gave positive feedback. He said that, "this kind of activity should be carried out at regular interval in their community as their knowledge regarding hygienic practices is very less". He also told us the reason behind not using ORS during diarrhoea, is their lack of knowledge in its preparation. One other person said that because of this even if packets of ORS are freely available from heath centers, they keep it at home without using it. Children of that faliya get repeated infection because of poor nutritional and sanitary hygiene. The one who is leader of them constantly advised community members to build a toilet inside their house, but nobody paid attention. He also requested us to do a transect walk in their area to look at the real situation. So we divided ourselves in 4 groups and had a transect walk. Starting from the center, we went in four different directions and look out for situation of their "faliya" and their houses. Their houses were of kachcha type and merely few houses have toilet facility that too without proper water supply. We also realized that to understand the

problem of community members it is necessary to go in between them and listen to their problems and then find solution of it.

**Recommendations :**

Health talk and demonstration is an effective method to spread health messages in a community. It's a simple yet efficient way to make people understand difficult messages. In India where still so many people reside in villages, have poor knowledge regarding health and hygiene, activities like health talk, role-play and demonstration play a very important role in improving their knowledge on sanitation and communicable diseases. Such activities should be planned on regular intervals while celebrating international health days and weeks. It should be carried out in villages based on their needs after doing community survey or after a transect walk in the community.

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