HEALTHLINE

I.A.P.S.M.

VOLUME : 13 ISSUE : 4 OCTOBER – DECEMBER – 2022

For more details visit : www.healthlinejournal.org

Correspondence

Editor in Chief, Healthline Journal, Community Medicine Department, GCS Medical College, Hospital and Research Center, Opp. DRM Office, Nr. Chamunda Bridge, Naroda Road, Ahmedabad-380025, Gujarat. Telephone: 07966048000 Ext. No. 8351, Email: editorhealthline@gmail.com.

Disclaimer

Healthline journal is indexed with

Index Copernicus, DOAJ, OPENJGATE, CABI, Index Medicus-SEAR

HEALTHLINE JOURNAL

A National Journal of
Indian Association of Preventive and Social Medicine managed by IAPSM-GC
Volume 13 Issue 4 (October-December 2022)

INDEX

Content	Page No.

<u>INDEX</u>

Content	Page No.

Adult Immunization: A Neglected Domain

Shweta Mangal

Professor, Community Medicine Department, Mahatma Gandhi Medical College, Jaipur, Rajasthan, India

Correspondence : Dr. Shweta Mangal, Email: dr.shwetamangal@gmail.com

"Long Life for All" being the theme for this year's **World Immunization Week 2022,** celebrated annually in the last week of April (24th to 30th April) aims to unite people on the idea that vaccines make it possible for people to pursue their dreams, protect loved ones and live a long and healthy life. It aims to highlight the collective action needed and to promote the use of vaccines to protect people of all ages against disease.[1]

Immunization is one of the world's most successful and cost-effective health interventions available to avert vaccine preventable diseases and deaths. Since at least the 1400s, people have looked for ways to protect themselves against infectious disease. From the practice of "variolation" in the 15th century to today's mRNA vaccines, immunization has a long history. For over two centuries, vaccines have helped in keeping people healthy starting from the first vaccine that was developed to provide protection against smallpox to the latest ones that are being used to prevent COVID-19.

With the help of vaccines, humans can progress without facing the burden of diseases such as polio, smallpox, etc. Vaccines are continuously being advanced bringing humanity closer to a world that will be free from cervical cancer, tuberculosis, etc, and also ending suffering from childhood diseases such as measles and tetanus.[2] Immunization is the process or the act of making the individuals immune which is usually done during childhood. At times immunization is considered synonymous with child immunization. However, very few know about adult immunization. Regardless of age, we need immunization against a whole gamut of vaccine-preventable diseases to maintain good health and lead a disease-free life.

Childhood vaccines are well established in India under Universal Immunization Program (UIP) but there is no formal immunization program in India like UIP. In a country like India with a population of 1.3 billion, the adult population accounts for about 60% of the total population. Also, the life expectancy has risen from 52.52 years in 1980 to 69.27 years in 2020.[3] The adult age groups (more than 18 years) along with adolescents present an important additional target for existing immunization programs. We generally assume that the vaccinations we receive as children are enough to safeguard us throughout life. Contrary to this belief, our need for immunization does not stop with childhood.

Adults do require vaccination protocols with booster doses for hepatitis, pneumococcal and other communicable diseases. In the adult population because of the changing lifestyle, demographics and significant increase in life expectancy the concept of adult immunization was thought of. [4]

The WHO scientific advisory group of experts(SAGE) to the Global programme for vaccines and immunization (GPV) has indicated the need to expand immunization activities beyond infancy, either as part of routine immunization services, or as a part of disease elimination and/or eradication measures.

Vaccination is needed throughout one's life to protect against various infectious diseases and their complications. Adulthood requires letting go of some of our childhood habits, but vaccines are not one of them. To maintain optimal immunity, many of the immunizations that we received as children, must be repeated for adults. Adulthood comes with a new set of duties, but it also comes with a new set of immunizations.[5]

Need for Immunization in Adults:

- Many adults have never been administered vaccines during childhood.

- Some of the vaccines available now were not available a few years ago.

- Immunity due to vaccines given in childhood wanes from the adolescent group onwards.

- People doing extensive travel, especially foreign countries, are at higher risk of catching infection.

- Due to advancing age, occupation or comorbid conditions adults are at greater risk for certain vaccine preventable diseases (VPDs).

- VPDs are expensive both in terms of lost earnings as well as cost associated with health care as compared to cost of vaccination which is often much less.

- Most VPDs have not been eliminated, thus adults may be exposed to these illnesses due to contact with carriers.

- Adult immunization also strengthens protection provided by herd immunity.

- Infected adolescent and adult population may act as reservoirs of infection for neonates and others like older grandparents or family members or co-workers.

Vaccines are recommended for all adults starting at 19 years as diseases have no age and even young and healthy people can also get sick. Healthy adults are usually not aware about adult immunization. It is usually thought that vaccines are for kids, old people or those having poor health. They are usually not aware of vaccine preventable diseases like whooping cough, shingles, Human Papilloma Virus (HPV) etc. that can affect adults. Also, usually there are no recommendations for vaccination from health care professionals, except for influenza or pneumococcal in some cases or at work sites or for travel abroad.

Many adults with health conditions like pregnancy, those with HIV/ weakened immune system or liver disease or those with comorbid conditions like asthma, heart, lung diseases or diabetes are highly vulnerable to vaccine preventable diseases. Pneumococcal, meningococcal, and Haemophilus influenzae (HIB) vaccinations are indicated for patients after splenectomy.[6] Also transplant patients even if adults need vaccination.[7]

Vaccines can be even used for treatment of neoplastic diseases, like BCG can be used in early-stage bladder cancer. Sipulence -T can treat prostate cancer and talimogene laherparepvec can treat melanoma.[8] Some newer vaccines are just for adults and teenagers, such as the Human Papillomavirus Vaccine (HPV vaccine) can prevent cervical cancer in young women and genital warts/ anal cancer in both genders.

Bottlenecks and Barriers to Adult Immunization

In spite of the heavier burden of diseases, vaccines recommended for adults are not widely used. There are several reasons for this.

- There is a limited perception on part of the health care providers and beneficiaries that adult vaccine preventable diseases are significant health problems.

- There are doubts in the minds of some health care providers and the public about the efficacy and safety of several of the vaccines used for adults.

- Adult immunization is selective not universal, different vaccines have different target groups.

- Healthy adults are harder to reach through the public health system and hence vaccination of this age group becomes difficult.

- United Access – There are no Institutions for adults, which can facilitate a broad Immunization requirement.

- Less stress on preventive Care-There is a lack of knowledge and apathy regarding adult VPDs among health care providers.

- Cost of Immunization – Maximum insurance policies in India, do not cover the cost of Immunization, newer vaccines for adults are expensive and may increase the out-of-pocket expenditure.

  Adult immunization schedule has been recommended by the Centers for Disease Control and Prevention.[9] Various Adult Vaccines used are ;

- Flu (Influenza)

- Td/Tdap (Tetanus, Diphtheria, Pertussis)

- Shingles (Zoster)

- Pneumococcal

- Meningococcal

- MMR (Measles, Mumps, Rubella)

- HPV (Human Papillomavirus)

- Chickenpox (Varicella)

- Hepatitis A

- Hepatitis B

- Typhoid

- COVID -19

Need for change in healthcare policies:

Vaccines are critical for preventing mortality and morbidity, since infections account for more than a quarter of all fatalities. To decrease the health implications of vaccine-preventable diseases in adults, significant improvements and increase in adult immunization are required. In India, incomplete and inadequate immunization against various infectious diseases results in substantial and avoidable hospitalization and treatment costs. Usually, people spend a lot on child health as compared to the health of elderly; also child immunization has been focussed so much by our medical professionals, Indian Government and World Health Organization (WHO). We need to change this attitude and prioritise adult immunization too. Healthcare policy planners and healthcare providers must be made aware of this critical topic. The Ministry of Health and Family Welfare of India must develop policies and procedures focussed on adult immunization. Adult vaccination should be made a standard aspect of immunization since these vaccinations can save millions of lives in India alone.[4]

Quite a times adult immunization is considered as a LUXURY for the people of high socio-economic status, as the vaccines used are a bit expensive. During the COVID era, our country has set an example by producing the COVID vaccines in our premises. Similarly, we can focus on further production of various vaccines used for adult immunization ,making them cost effective for use and fulfilling the motto of **"Vocal for Local".**

Also, as our country is transforming its status from a developing nation towards a developed nation, we have been able to control a lot many infectious diseases , so we can focus more on research to develop vaccines for adults for non-communicable diseases which are on an increasing trend among the population.

Conclusion:

Suffering from a vaccine preventable disease is expensive as compared to getting vaccinated against them and staying healthy. Like diet and exercise, vaccines are an important part of staying healthy. They play a vital role in helping the immune system and keeping adults healthy just like eating wholesome foods and exercising regularly. Thus, it is in our best interest as adults to take charge of our

own preventive health care by learning about recommended vaccines, seeking them out and encouraging others also to get immunized. Our responsibility extends further too, being a medical professional in making people aware about these.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References :

1. WHO. World Immunization Week 2022 [Internet]. Available from: https://www.who.int/campaigns/world-immunization-week/2022 [Last accessed on 03/12/2022]

2. GKTODAY. World Immunization Week – Update (April, 2022)[Internet].Available from:https://www.gktoday.in/topic/world-immunization-week-update-april-2022/ [Last accessed on 03/12/2022]

3. Life Expectancy in India. Available from: https://www.statista.com/statistics/1041383/life-expectancy-india-all-time/ Last Accessed on 18/01/2023.

4. Chakravarthi P S, Ganta A, Kattimani VS, Tiwari RV. Adult immunization—Need of the hour. J Int Soc Prevent Communit Dent. 2016;6:272-277.

5. Dhekne P N.Forbes India Blogs [Internet]. Pruthu Narendra Dhekne 2021 Dec. Available from https://www.forbesindia.com/blog/health/why-adult-immunization-should-be-a-part-of-healthcare-policy/

6. Webb CW, Crowell K, Cravens D. Clinical inquiries. Which vaccinations are indicated after splenectomy? J Fam Pract. 2006 Aug;55(8):711-2. PMID: 16882446.

7. Guidelines for vaccination of solid organ transplant candidates and recipients. Am J Transplant. 2004; 4(Suppl 10):160–3. Available from: https://doi.org/10.1111/j.1600-6135.2004.00737.x [Last accessed on 03/12/2022]

8. What are cancer vaccines? Cancer.Net [Internet].Available from:https://www.cancer.net/navigating-cancer-care/how-cancer-treated/immunotherapy-and-vaccines/what-are-cancer-vaccines. [Last accessed on 03/12/2022]

9. CDC 24/7: Saving lives, Protecting People. United States, 2022[Internet]. Available from:cdc.gov/vaccines/schedules/hcp/imz/adult.html#table-age. [Last accessed on 03/12/2022]

Integrated Learning Program for Third Year Professional Students at a Medical School of India

Shobha Misra

Professor & Head, Department of Community Medicine, P. D. U Medical College, Rajkot, India

Correspondence : Dr. Shobha Misra, Email: shobhafaimer@gmail.com

Abstract:

Introduction : Though, Medical Council of India had recommended introducing horizontal and vertical integration, an integrated approach to teaching medical subjects has not become popular in Medical Colleges in India. **Objective:** To develop, implement, and evaluate an Integrated Learning Program for the third-year professional students at a medical school in India. **Method:** The Integrated Learning Programme (ILP) was conducted for the first time in 2016 for a batch of 181 third year professional students of a Medical School in Western India. It was an integrated module employing correlation and vertical integration. It incorporated Interactive Lectures, Videos, Self-study, Clinical Visits and Home Visits. Student assessment was formative using pre and post Multiple Choice Questions (MCQs) test and case presentation through checklists to assess clinical skills and home visit skills. Evaluation of the programme was based on feedback from the students and faculty members and report prepared by the students. **Results:** The mean score of students in the knowledge domain assessed through Multiple Choice Questions (MCQs) for ILP on Iron Deficiency Anemia conducted at the end of the ILP was statistically significantly (P=0.022). The feedback from faculty members and students was positive, highlighting benefits of ILP as; integrated learning of the basic sciences, their application to clinical cases and active student learning. Few challenges were also identified like higher input required from faculty members. Most of the faculty members and students recommended that the integrated programme should be continued and extended to other parts of the curriculum. **Conclusion:** The study findings conclude that an integrated learning programme is beneficial and is likely to improve quality of health care provided to the patients. It is feasible within a conventional medical curriculum of an Indian Medical School.

Key words : Curriculum, Integrated Teaching, Medical Education, Teaching-Learning methods, Undergraduates

Introduction:

Integrated learning refers to when knowledge and skills from across the disciplines are called upon to address patient cases, problems and issues and also to create learning experiences for students.[1-3] Integrated approach is responsive to students' needs and is more concerned about how well students are prepared to assume future societal roles. The integrated curriculum is structured to foster relationships among learners, teachers and the content itself by which students acquire ability to perceive patient as a whole. The non-integrated approach on the other hand imparts knowledge in a disjointed manner which does not allow students to

develop skills to investigate, analyze and become critical thinker. [2-4]

The integrated approach to the teaching of topics in a course is well accepted as an effective educational strategy.[5-8] Its introduction in the medical course has been advocated by Medical Council of UK [9] and Medical Council of India.[10] The Medical Council of India has recommended introducing horizontal and vertical integration for teaching undergraduate medical students as early as 1997 and then in the Vision 2015 document,[11] in order to provide the students with a holistic rather than fragmented learning perspective. The SPICES model (Student-centered, Problem-based, Integrated, Community-based, Elective & Systematic) of educational strategies describes Integration as a continuum with complete integration on one end and traditional teaching on the other. Though, Medical Council of India had recommended introducing horizontal and vertical integration, an integrated approach to teaching medical subjects has not become popular in Medical Colleges in India.[10] The GMR 2019,[12] represents the first major revision to the medical curriculum since 1997, it lays emphasis on learning which is competency-based, integrated, acquisition of skills, ethical and humanistic values. At the study setting Integrated Learning Program (ILP) was part of Undergraduate (UG) teaching prior to 12 years of the study. There was a felt need to revive an effective integrated learning program. Also, to have an educational experience of implementation of the proposed recommendations of integration as mentioned in the Vision 2015,[11] at the institute, the study was conducted with an objective to develop, implement and evaluate an Integrated Learning Program for the third-year professional students at a medical school in India.

Method:

An Integrated Learning Program was introduced for the first time for third year professional students when they had completed their second-year exams at a medical school located in western part of India during November 2015 to July 2016. The school otherwise had a subject-based traditional curriculum. There were 181 students in the batch and all were exposed to the ILP.

Topic of Integrated Learning Program was "IRON DEFICIENCY ANAEMIA" (IDA) and type of Integration was Vertical Integration. Iron Deficiency Anemia is a highly prevalent nutritional deficiency disease that affects 65%-75% of women of child bearing age in India; a major public health problem in the country.

Correlation: Out of the 11 steps; Isolation, Awareness, Harmonization, Nesting, Temporal Co-ordination, Sharing, Correlation, Complementary, Multi-disciplinary, Inter- disciplinary and Trans-disciplinary as suggested by Harden RM,[6, 13, 14] on the integration ladder, correlation was employed (Figure 1). In correlation, the emphasis remains on disciplines or subjects with subject-based courses taking up most of the curriculum time. Within this framework, an integrated session or course is introduced in addition to the subject-based teaching. Participating departments were; Physiology, Biochemistry, Pathology, Medicine, Surgery, Obstetrics Gynecology, Pediatrics and Preventive and Social Medicine (PSM).

Steps followed in the conduction of Integrated Learning Program were:

Step 1: Approval from the Institutional Ethics Committee;

Step 2: Formation of Core- Committee from participating departments;

Step 3: Orientation of the faculties; A total of 20 faculties attended this session & interested one (10) were short listed for faculty development program;

Step 4: Orientation of the students;

Step 5: Faculty development Program;

Step 6: Selection of appropriate cases/patients;

Step 7:Student allotment; There were 181 student participants. In order to effectively achieve the objectives of ILP program it was decided to allot ten students per case in the wards.

Design/development of the intervention: The duration of the program was of two weeks and teaching & learning methods employed were: Interactive Lectures, Videos, Self-study, Clinical Cases, Home Visits.

The ILP had three components;

1. Pretest; Pretest in form of MCQs was administered followed by integrated teaching that took place for three days; on the first day the importance of studying IDA was discussed. Topics related to basic sciences and pathology of anemia in general with emphasis on IDA were revised and reviewed. On the second day clinical aspect of anemia with emphasis upon IDA along with principles of management were discussed. And on the third day communication skills and prevention and control were discussed.

2. Ward/Clinical Visits: Clinical case exposure was for four days with a batch of 50 students each. They were posted in four clinical departments viz; Medicine, Obstetrics & Gynecology, Pediatrics and Surgery. One case per group of ten students was allotted, a total of 18 cases supported by a check list were prepared.

3. Home visit: Seven home visits with a batch of 25 students each, supported by a check list were planned and conducted.

Assessment: To assess knowledge a pre and post test was administered utilizing MCQs. Additional skills were assessed during clinical sessions through case presentation supported by checklist and assessment of home visits also through a checklist. It was an integrated assessment with inputs from all the participating faculties.

Evaluation: Feed back was obtained from students through a semi structured feedback tool, oral feedback by a few randomly selected students and reports prepared by them. Feedback from faculties

was obtained through a semi- structured feedback tool.

Analysis:

Quantitative: Paired t-test was applied to compare scores obtained in the MCQ test. Semi-quantitative data analysis was done using a five-point Likert scale,where; 1=Poor 2=Fair 3=Good 4=Very Good 5=Excellent. The scores on the scale were expressed as frequency distributions.

Qualitative: Emerging themes were analyzed. MS excel sheet was used to enter and analyze data. For feedback, the tool was assessed manually and emerging themes were developed.

Results:

Out of the 181 students, 136 (70%) gave the pre-test paper though there was 90% attendance on the first day and 119 (66%) gave the post-test on the last day. There were 99 (54.7%) students who took both the tests. Reasons for non-participation in the program included; sports activity, illness, and repeat examinations. Forty faculties were oriented on the process of ILP from different departments and ten of them actually participated in teaching and training of ILP. Almost all faculties who participated were available for the entire duration of ILP.

Assessment:

Assessment of Knowledge(the content): In order to have an integrated assessment, a set of 20 MCQs prepared by faculties from different departments were administered before and after the program. The MCQs also included case history type questions (8) to test their analytic skills (higher intellectual skills) for integrated assessment. The mean score obtained by the students in the MCQ assessment was statistically significantly (t value = 2.33, df = 98, p = 0.022). Higher mean score was obtained by the students at post-test as compared to pre-test as shown in Table 1.

Integrated assessment of clinical sessions through case presentation & checklist; Eighteen cases supported by a check list were selected to be assessed by faculties. Out of which, ten were

Figure 1: Integration concepts framed in the GMR 2019 [14, 6]
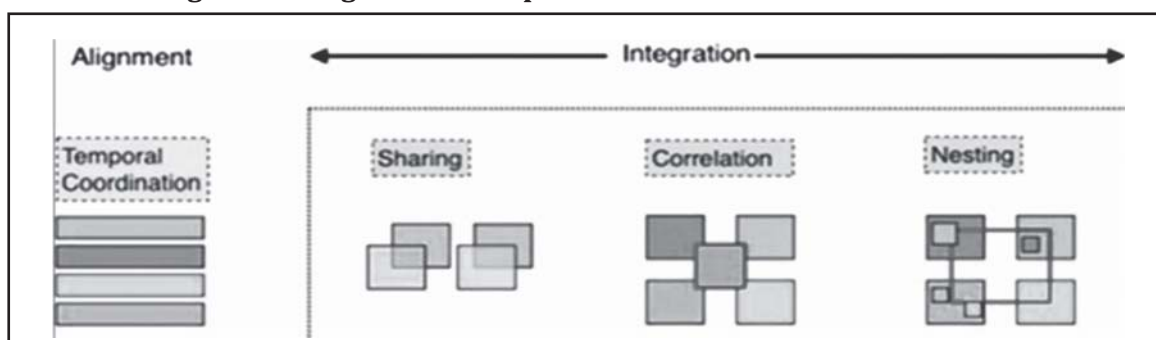
Table 1: Mean Score Obtained by the Students in the MCQ Assessment

	Pre-test	Post-test
Number of students	136	119
Mean Score **95% CI***	10.0074 (5.98 - 14.02)	10.6723 (5.47 - 15.87)
SD	2.0129	2.6009
Paired t-test (N=99)	t value = 2.33, df = 98, p = 0.022**	

*CI=Confidence Interval, ** Statistically significant (paired "t" test, p=0.022)

completed and returned by them. The major strengthsas reported by the teachers were: The students' demonstrated good skills in history taking of complaints and personal history. However, they lacked interpersonal skills in communication; in terms of; making eye contact, use of medical jargons, proper explanation of examination, reassurance and checking understanding of the patient. Some of them failed to elicit clinical signs of anemia like checking of pallor, making a provisional diagnosis and eliciting treatment seeking behavior. All of them mentioned that the assessment needed to be conducted in some more organized manner.

Assessment of home visits through checklist; Seven home visits with a batch of 25 students each and supported by a check list were conducted. The visits were conducted at homes of patients who were admitted in the wards and discharged. Five visits were from slums and two were from nearby villages. They made a clinico-social diagnosis after assessment of the health status of the family. A quote from one of the students was "Home visit was conducted at patient's house. Our professors accompanied us and taught us how knowledge about just few public health parameters helps us discover the route of the problem to correct it." Another student said "Interactions with the patients in the hospital and community is all together a different and difficult task. At the home of a patient, i.e., in the community, we got to know the environment of patient's house, one of the epidemiological triangles."

Evaluation of ILP:

A. Feedback from Faculty Members; Out of the ten faculties who participatedin ILP, nine(90%)of them were available for giving written feedback on the last day. The different aspects of the feedback were as follows;

• **Facilitator Training Program:** Almost all rated the effectiveness of the Facilitator Training Program as good to excellent on a five-point Likert scale.

Major Strengths of the Facilitator training Program: Redundancy was eliminated. A good strength of faculty participated, leading to integration of faculties from different

departments on a common platform that enhanced coordination between them.

Recommendations: Higher inputs and interaction among faculty members and before implementation more meetings should be arranged.

- **Clinical Visits:** Three quarter of them rated the effectiveness of the Clinical Visits in introducing the students to history taking and physical examination of IDA, in helping students observe abnormal physical signs, introducing the students to the pathophysiology of symptoms and signs related to IDA and correlating these with derangements in physiology, biochemistry as good to excellent.

Strengths of Clinical Visits: There was good patient-student and student-teacher interaction. The checklist for observing student interacting with the patient by teacher and subsequent group feedback was good. Recommendations : Presence of all students to be made compulsory.

Checklists : Most of them mentioned that it was well prepared, structured and comprehensive and the same could be regularly used in routine ward posting. However, they also thought that Clinical visit should be scheduled in smaller groups, so that actual correction of student's mistake is possible.

- **Home Visits :** Cooperation from faculty and student, interaction with patient and relatives and direct observation of socio-environmental condition were major strengths.

Recommendation for improving the Home Visits: Proper communication with patient should be made before planning a visit and full address should be noted. Identification of suitable family and at least two-family visits should be conducted to elicit complete information of the family. The visits should be conducted in small batches comprising of not more than ten students.

Assessment: Majority (8/10) of them rated the effectiveness of the Test (MCQ) in helping students learn the learning objectives drawn at the end of each session as good to excellent. Few suggested additions of some theory-based question and OSCE based assessment. A quote from a faculty "This also enhanced coordination between different departments. ILP gives integrated learning for particular topic and prevents repetition". Almost all members mentioned that they would recommend expanding the ILP to other systems, problems and with future batches. Other topics like Diabetes, Hypertension, HIV, Coronary Heart Diseases, Tuberculosis, Malaria, Cardio Vascular System and Respiratory System were suggested for inclusion. More faculties should be included in this programme was mentioned by most of them.

B. Feedback from students; ILP Content: It helped them to apply concepts taught from the basic medical sciences to understand clinical disease, developing skills in self-directed learning, in addressing the different learning styles of students learning through a variety of teaching learning methods used.

Teaching–Learning Methods: Home visits and discussions on the same, clinical case in the wards and discussions and assessment were rated good to excellent by two –third of them. Two-third students recommended that ILP as tool should be continued for and extended to other common health problems. Some of them gave reasons for the same as, it is easy to understand, ILP is knowledge improving programme, enhances students' awareness, better method of learning, more explanatory and holistic and could help to improve communication skills. One-fourth mentioned that this was a good experience. However, a fifth of them thought that it should not be continued and majority of them gave the reason that ILP is time consuming, a burden and boring.

Major strengths of the ILP: One-third students mentioned that case studying in the wards and home visits are the major strength of ILP. Few mentioned inter-active nature of sessions and good student

involvement. According to a tenth of them it involved student's integration of all subjects, clinical correlation and discussion. A few mentioned it led to motivation and was an enjoyable experience. Few suggestions from a fourth of the students were; to reduce lecture content and more time should be given for home visits and for health education to the patient; more emphasis to be given to more case studying, ward posting, picking interesting disease and proper management of the program with inclusion of more faculties.

Student's Quote while reviewing a report prepared by a group of students: "This entire program has helped us view medical science from a different perspective, enhanced our approach to learning, enucleated experience has enlightened the spirit of curiosity in us-to find a way to quench the thirst of knowledge. It was a wonderful experience to revise basic sciences and to integrate the same with clinical aspects and application."

Discussion:

Educational program has a better chance of being effective if its purpose is clearly expressed.[15] One can give an analogy of functioning of human body, where no system functions in isolation but operates in an organized and interdependent manner to achieve optimum level of functioning.[1,3] Medical teachers should present the vast amount of information to the students in a planned, organized and integrated manner.[1,3] Students find the preclinical subjects drab and boring. One of the main reasons is the theoretical and fragmented manner,[16] in which they are taught by each preclinical department at different times, without any awareness of what is taught by other departments. This disjointed approach to the topic leads to unnecessary repetition, loss of valuable time and also creates confusion in the student's mind. The current study found out that the mean score of students in the knowledge domain on the ILP was statistically significantly (p=0.022). A study by Muthu Kumar T et al,[16] also utilized MCQ for assessment and found the

pre- and post-test scores to be statistically significant. Almost all of the faculty members rated the effectiveness of the ILP in helping students to integrate the knowledge of basic sciences in the context of the clinical cases. Occasional reports have been published on successful trial of integrated teaching in India based on the feedback received from the students[3,8,9,17-24] Citing similar experiences. Studies by Gosh et al, [17] and Shafi et al,[18] concluded that the adoption of integrated module and the use of multiple teaching and learning methods had proven to be useful in acquisition of knowledge from the students' perspective; students and faculty expressed an overall satisfaction towards ILP. This study showed that it was possible to adopt integrated learning module in first year of medical course. Study carried out by Kate et al, [3] reported findings very similar to this study. They have quoted that; the new teaching learning method of integrated teaching was found to be more effective and has been well accepted by faculty as well as students. Students showed better clinico-pathological correlation along with improvement in cognitive and psychomotor domains. A study carried out by Vyas et al, [8] also found that the feedback from faculty and students was positive, which highlighted benefits such as integrated learning of basic sciences. Kalpana Kumari MK et al,[24] have also mentioned in their article, that the students recognized that integrating the medical subjects was useful and of interest to them, and that it should be continued.

Conclusion :

An integrated learning programme was effective in enhancing knowledge, attitudes and motivation of learners The program is feasible within a conventional medical curriculum. Most of the faculties and students recommended program continuation and expansion to other parts of the curriculum by identifying topics which can be taught as ILP. The enthusiasm, hard work and integrated efforts by the faculty members who participated in the programme were extremely important for the success of this intervention.

Limitations:

Though there were challenges like: difficulties in arranging home visits in small groups; in spite of all efforts two-third students participated and some of the reasons for the same being- sports activity, illness, repeat examinations etc.; higher inputs required from faculties as the entire faculty members could not attend all time due to other responsibilities (time constraint); finding ways for assessment to carry weight-age in the overall performance assessment of students to improve attendance. However, the challenges provide opportunities to innovate and experiment with various models of integration and evaluate their utility in the Indian context, especially in the new curriculum. The challenges as identified by the study should be considered while scaling the program to other batches.

Recommendations:

A Focus Group Discussion with a sample of students and faculty prior to the implementation of Integration would add to information on student attendance and other perspectives to enrich the ILP in future. The assessment should have some weight-age in the internal marks of the students. A module prepared well in advance should include method of assessment so that students are informed of the weight age of marks. For integrated assessment it's always good to have an integrated question bank of MCQ, Short Answer questions and Clinical cases.

Establishment of Phase-Wise Curricular Sub-Committee and Alignment and Integration Team (AIT) to work in collaboration with Curriculum Committee under GMR 2019, is now in place to formulate and facilitate the integration at the institutional level. This requires robust planning and coordination amongst the medical educationists at all the levels. Integrated teaching can succeed only through an official institutional policy and not optionally by departments. The whole faculty should meet frequently to review the experiences of previous year and reform the local methods immediately/ regularly.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References:

1. P.S. Bhuiyan, N.N. Rege, and A.N. Supe: (second edition): The art of teaching medical students. Medical Education Technology Cell, Seth G.S. Medical College and K.E.M. Hospital, Mumbai: 305-312.

2. Jamkar A, Yemul V, Singh G. Integrated teaching programme with student-centred case-based learning. Med Educ. 2006 May;40(5):466-7. doi: 10.1111/j.1365-2929.2006.02438. x. PMID: 16635134.

3. Kate MS, Kulkarni UJ, Sape A, Deshmukh YA. Introducing Integrated teaching in undergraduate medical curriculum. International Journal of Pharma Sciences and Research (IJPSR). 2010; (1): 18-22.

4. Haranath P. Integrated teaching in medicine - Indian scene. Indian J Pharmacol 2013; 45:1-3.

5. Schmidt H. Integrating the teaching of basic sciences, clinical sciences and biopsychosocial issues. Acad Med 1998; 73(suppl 9): S24-S31.

6. Harden RM. The integration ladder: A tool for curriculum planning and evaluation. Med Edu 2000; 34:551-7.

7. Dunaway GA. Faingold CL. Development and implementation of a multidisciplinary sophomore medical curriculum: Integration of Pharmacology with basic and clinical sciences. Pharmacologist 2001; 43:83-90.

8. Vyas R, Jacob M, Faith M, Isaac B, Rabi S, Sathishkumar S, Selvakumar D, Ganesh A. An effective integrated learning programme in the first year of the medical course. Natl Med J India. 2008 Jan-Feb;21(1):21-6. PMID: 18472699.

9. Tomorrow's doctors: Recommendations on Undergraduate Medical Education ; December 1993. London: General Medical Council. Education Committee; 1993. p. 23–24. URL: https://www.yumpu.com/es/document/read/47554869/tomorrows-doctors-1993-general-medical-council.

10. National Medical Commission. [Internet]. SALIENT FEATURES OF REGULATIONS ON GRADUATE MEDICAL EDUCATION, 1997 Mar 4, 1997. Available from: https://www.nmc.org.in/rules-regulations/graduate-medical-education-regulations-1997/

11. Medical Council of India. Reforms in Under-graduate and post-graduate medical education, Vision 2015 [Internet]. Medical Commission of India; [cited 2022Dec9]. Available from: https://www.tnmgrmu.ac.in/images/medical-council-of-india/MCI_book.pdf

12. Medical Council of India. Graduate Medical Regulations - 2019 (GMR 2019) [Internet]. Medical Commission of India; [cited 2022Dec9]. Available from: https://www.nmc.org.in/Activiti

WebClient/open/getDocument?path=/Documents/Public/Portal/Gazette/GME-06.11.2019.pdfDavid G. Brauer& Kristi J. Ferguson, Washington University School of Medicine, USA, University of Lowa , USA; The integrated curriculum in medical education: AMEE guide No. 96.

13. Medical Council of India. Module 4: Alignment and Integration [Internet]. 2019 [cited 2022Dec9]. Available from: https://www.nmc.org.in/wp-content/uploads/2020/08/Alignment-and-Integration_03.10.2019.pdf

14. Rattan A. Curriculum Development for Integrated Teaching of Infectious Diseases including Tuberculosis. Ind. J. Tub. 1994:41-67.

15. S Joglekar, PS Bhuiyan, S Kishore. Integrated teaching--our experience. Journal of post graduate medicine 1994; 40 (4): 231-2 ISSN

16. Muthukumar T, Konduru RK, Manikandan M, Asir J, Iqbal N, Bazroy J, et al. Scope of integrated teaching in a medical college: A study from South India. J Med Soc2017; 31:127-30.

17. Gosh S, Pandya H. Implementation of Integrated Learning Program in neurosciences during first year of traditional medical course:Perspection of students and faculty. BioMed Central Medical Education2008; 8: 44.

18. Shafi R, Quadri K, Ahmed W, Mahmud S and Iqbal M. Experience with a theme-based integrated renal module for a second-year MBBS class. Advan in Physiol Edu 2010; 4:15-19.

19. Sameer M. Khan. "Integrated Teaching: A New Approach in Medical Teaching". Journal of Evolution of Medical and Dental Sciences 2014; 3 (57): 12939-12945.

20. AmudhaKadirvelu& Sunil Gurtu.Integrated Learning in Medical Education:Are Our Students Ready? Med.Sci.Educ 2015; 25:549–551

21. Yadav P, Chaudhary M, Patel J, Shah A, Kantharia N. Effectiveness of integrated teaching module in pharmacology among medical undergraduates. International Journal of Applied and Basic Medical Research 2016; 6 (3): 215-219.

22. Prabhu N, Wilfred P, Shanthi M..Integrated Learning Programme in Teaching Pharmacology Indian Journal of Applied Research2020; 10 (12): 70-73.

23. Kulkarni A, Gowda V, Rao C, Rao MY. Multiple Case Scenarios Based Integrated Teaching among First Year Medical Students-A Cross-sectional Study.Journal of Clinical and Diagnostic Research 2021;15(5): JC01-JC05

24. Kalpana Kumari M.K, Mysorekar V, Raja S. Student's perception about integrated teaching in an undergraduate medical curriculum. Journal of Clinical and Diagnostic Research. 2011 (Suppl-1);5(6): 1256-1259

Delay in Diagnosis of Stomach Cancer Patients Attending a Tertiary Care Hospital in Kashmir: A Hospital Based Cross Sectional Study

Tanzeela Bashir Qazi [1], Awhad Mueed Yousuf [2], Mohammad Iqbal Pandit [3], Muhammad Salim Khan [4]

[1]Postgraduate scholar, [3]Associate Professor, [4] Professor & Head, Department of Community Medicine, Government Medical College, Srinagar, Jammu & Kashmir,

[2]Directorate of Health Services Kashmir, Jammu & Kashmir

Correspondence : Dr. Tanzeela Bashir Qazi, Email: qazitanzee@gmail.com

Abstract:

Introduction: The incidence of cancer is increasing throughout the world. However, early detection of cancers is associated with a favourable outcome. Stomach cancer is one of the most common cancers of gastrointestinal tract. Majority patients visit physicians in developed stages. **Objective:** To evaluate the reporting pattern of stomach cancer patients living in Kashmir valley in order to determine the median time of delay from the beginning of symptoms to diagnosis. **Method:** Total 116 proven stomach cancer patients were evaluated for the pattern of presentation at endoscopy laboratory of Super Speciality Hospital, Shireen Bagh Kashmir from April 2019 to September 2020. **Results:** In this study, the mean age (SD) of participants was 60.22 ± (11.90) years. Majority of the participants (69.8%) were males. Cases were predominantly from the rural area (58%).Only 15.5 % of the cases were diagnosed within one month of their symptoms while as 3.4% of the cases had a total delay of more than 12 months. The study found a considerable total delay in the diagnosis of stomach cancer. The mean of the patient delay was 45.6 days. The median total delay was 20 weeks. **Conclusion:** Since stomach cancer has high mortality and morbidity rates associated, creating awareness among the population and training of physicians regarding timely referral of patients seems important.

Key words : Delay in diagnosis, Kashmir, Patient delay, Stomach cancer, Total delay

Introduction:

For centuries, cancer has been posing a major challenge to clinicians as well as epidemiologists throughout the world, contributing a major portion to the total deaths caused by non-communicable diseases. [1] Cancers of the gastrointestinal tract and the accessory organs of digestion (pancreas, liver, gall bladder) when considered collectively, have higher prevalence and cause more cancer related deaths than any other system in the body. In 2018, they accounted for an estimated 3.4 million deaths worldwide, with a further 4.8 million new cases diagnosed in the same year. Cancer of the stomach is the second most common cancer among cancers of Gastrointestinal tract. [2]

Stomach cancer is a major contributor of morbidity and mortality worldwide. It is the 5th leading cancer in the world and the 3rd most common cause of cancer related deaths. According to GLOBOCAN 2018, 1033701 (5.7% of total cancer) new cases of stomach cancer and 782685(8.2%)

stomach cancer related deaths occurred in 2018 globally. In India, stomach cancer is the 5th most common cancer (5.0 % of total) and the 5th most common cause of cancer related deaths (6-6% of total) among both genders together.[2] Traditionally stomach cancer has been reported to be more common in the southern parts of India, however recent reports have suggested a higher incidence in north-eastern regions of India including Jammu and Kashmir.[3]

Despite number of new diagnostic techniques, stomach cancer in its less aggressive stages is not diagnosed more frequently and hence the prognosis still remains poor. Thus, there is a possibility of delay in diagnosis as seen in literature also.[4] Early Diagnosis of cancer has important implications for patient care, researchers, and policy. When a diagnosis is made in a timely manner, a patient has the best opportunity for a positive health outcome because clinical decision making will be directed to a correct understanding of the patient's health problem. In case of stomach cancer, the prognosis is related to its clinico-pathological stage. However, there is no screening program, and even patients who develop suspicious symptoms may remain undiagnosed for many months or even years. The particular problem when dealing with stomach cancer is that there is no typical symptom which brings the patient to the doctor. Also, it is well known that delay in diagnosis is extremely important because cancers grow continuously, at differing rates, and that delay probably represents 1 – 2 doubling times of the tumour for most of the stomach cancer patient.[5] As this disease has relatively high prevalence in our part of the world and low survival rate, there is need to study any delay in reporting pattern of patients with stomach cancer. Therefore the present study was conducted with the aim to evaluate the reporting pattern of stomach cancer patients living in Kashmir valley in order to determine the median time of delay from the beginning of symptoms to diagnosis.

Method:

A Cross sectional study was conducted at Super Speciality Hospital, Shireen Bagh, which is an associated hospital of Government Medical College Srinagar, located in the Kashmir Division of the Union Territory of Jammu and Kashmir. It is one of the two multispecialty referral hospitals located in the Kashmir Division and provides specialist services like oncology, gastroenterology, cardiology, nephrology, among others. Study was conducted over a period of 18 months from April 2019 to September 2020.

Incident cases of stomach cancer diagnosed histo-pathologically were selected from Endoscopy Laboratory (Department of Gastroenterology) and General surgery ward (Department of Surgery). Persons residing in Kashmir since birth (original inhabitants of Kashmir) and histo-pathologically diagnosed stomach cancer were included in study. Patients diagnosed with any other malignancy in addition to stomach cancer, recurrent stomach cancer and those not giving consent were excluded from the study. Convenient sampling was used for the study. Due to time constraints, all the stomach cancer patients that reported during the study period were recruited for the study.

A total of 124 patients who had endoscopic findings suggestive of stomach cancer or were diagnosed with stomach cancer histologically during the study period were assessed for eligibility in the study. Twelve patients were enrolled from the Surgery ward, they were already histologically confirmed cases of stomach cancer and were awaiting surgery. One (01) patient among these did not give consent and two (02) were found to be recurrent cases and were therefore excluded. A total of 112 patients were considered eligible from the endoscopy laboratory immediately after they underwent upper gastrointestinal endoscopy and had endoscopic findings suggestive of stomach cancer. Upper gastrointestinal endoscopy was performed by an experienced gastroenterologist

under local anesthesia using a fiberoptic endoscope. Biopsy specimens of stomach lesions taken during endoscopy were sent for histo-pathological examination. Out of these 112 patients, histo-pathological report of four (04) did not confirm stomach cancer and hence were not included in the study, and one (01) patient did not give consent for the study and was excluded. Therefore, out of 124, 8 participants were excluded and hence total of 116 Patients were eligible for the study after fulfilling inclusion and exclusion criteria.

Selection of study participants
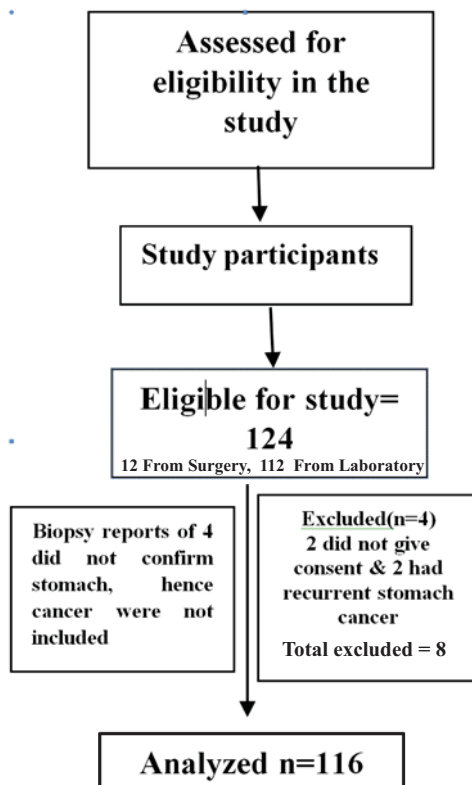
A total of 116 patients with endoscopic findings suggestive of stomach cancer and were biopsy report suggestive of stomach cancer were included in the study. Upper gastrointestinal endoscopy was performed by an experienced gastroenterologist under local anaesthesia using a fiberoptic endoscope. After selection, the study participants were thoroughly informed about the study. A written informed consent to participate in this study was obtained from all the study participants. A face-to-face interview was conducted by a Resident Doctor

from department of Community Medicine, Government Medical College Srinagar with each study participant based on a predesigned semi-structured questionnaire, which had been tested in a pilot phase on ten participants. The questionnaire elicited information on socio-demographic characteristics, presenting symptom, initial management of symptoms, Time from the first symptom to first contact with a Registered Medical Practitioner (Patient delay), Referral pattern, Time from the first symptom to diagnosis (Total delay) etc.

The data was entered in a Microsoft Excel spreadsheet and analyzed using SPSS software. Categorical variables were expressed as frequencies and percentages. Continuous variables were expressed as mean and standard deviation. Patient delay and total delay was expressed in the form of box and whisker plot. The study was approved by the Institutional Ethical Committee of Government Medical College, Srinagar.

Results:

In present study, the mean age (SD) of participants was 60.22 ± (11.90) years. Majority of the participants (69.8%) were males. Cases were predominantly from the rural area (58%). Around 48.3 % of the participants belonged to class III of modified Kuppuswamy Socioeconomic scale 2019[6] (lower middle) while as an equal number (48.3%) belonged to class IV of the modified Kuppuswamy Socioeconomic scale 2019. (Table1)

The most common presenting symptom among cases was pallor occurring in 25 (21.6%) patients followed by malena (18.1%). (Figure 1) Approximately four fifth (81%) of the cases sought consultation from a Registered Medical Practitioner (RMP) for their initial symptoms while as 12.1% of the cases sought early consultation from sources other than Registered Medical Practitioner like pharmacist, traditional healer. (Figure 2) Figure 3 demonstrates a box and whisker plot that shows

Table 1: Socio-demographic characteristics of study participants (N=116)

Variables	Frequency (%)
Age (years)	
Mean ± S.D	60.22 ± 11.90
<35	5 (4.3)
35-44	10(8.6)
45-54	9 (7.7)
≥55	92(79.4)
Gender	
Male	81(69.8)
Female	35(30.1)
Residence	
Urban	49(42.0)
Rural	67(58.0)
Socioeconomic status*	
Class II (upper middle)	4(3.4)
Class III (lower middle)	56(48.3)
Class IV (upper lower)	56(48.3)

*As per Modified Kuppuswamy Socioeconomic scale 2019[6]

patient delay in days. In this study, the first place of seeking medical advice for the majority of the patients (41.4%) was a Community Health Centre (CHC) while as private hospital consultation was preferred by only 9.4% of the cases.

Table 2 depicts the distribution of cases as per their time of the first contact with a doctor/medical facility after the onset of symptoms. The mean of the patient delay was 45.6 days. The distribution of cases as per the time taken from the onset of symptoms till the final diagnosis is also mentioned in Table 2.Only 15.5% of the cases were diagnosed within one month of their symptoms while as 3.4% of the cases had a total delay of more than 12months. The median total delay was 20 weeks (140 days) with an Interquartile range of 17 (Figure 4).

Figure 1: Distribution of participants as per their Presenting symptom
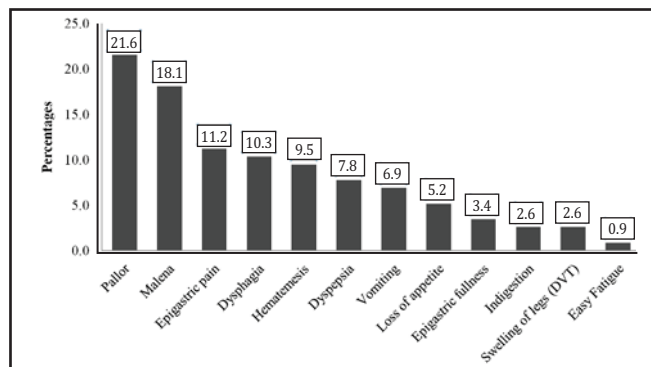
Figure 2: Distribution of participants as per their Initial management of symptoms
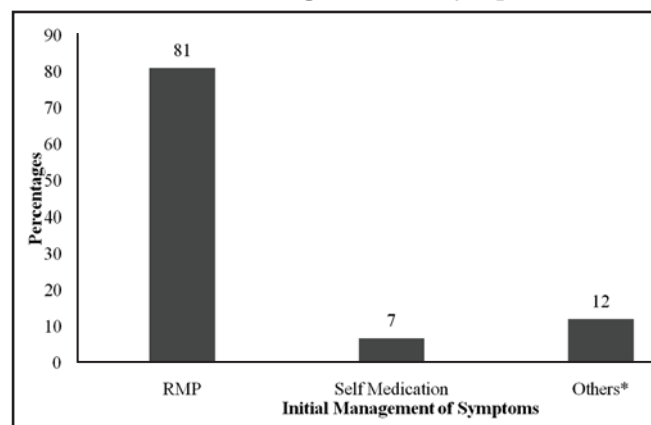
*Others include pharmacists, traditional healers.

Discussion:

The present study was a cross sectional study that was conducted at Super-Specialty Hospital, Shireen Bagh. A total of 116 participants were included in the study. In this study, majority of the participants (41.4%) were in the age group 65-74 years and majority of the participants (69.8%) were males.

The most common presenting symptom among participants was pallor occurring in 25 (21.6%) patients followed by malena (18.1%) and the least common symptom was fatigability which was reported by 0.9% of the cases. However, in a study conducted by Mikulin T et al, the commonest presenting symptoms among stomach cancer were increasing intensity of epigastric pain, vomiting, and dysphagia.[7] Distribution of cases as per their time of

Table 2: Distribution of participants as per patient delay and total delay (N=116)

Time to first contact with doctor/medical facility (patient delay)	Frequency (%)
Within 1 week	53 (45.7)
1-2 weeks	10 (8.6)
2-3 weeks	5 (4.3)
3-4 weeks	23(19.8)
1-2 months	4(3.4)
2-3 months	6(5.2)
> 3 months	15(12.9)
Time from onset of symptoms till final diagnosis (total delay)	
<1 month	18(15.5)
1-3 months	46(39.7)
4-6 months	17(14.7)
7- 12 months	31(26.7)
>12 months	4 (3.4)

Figure 3: Box and whisker plot showing patient delay in days
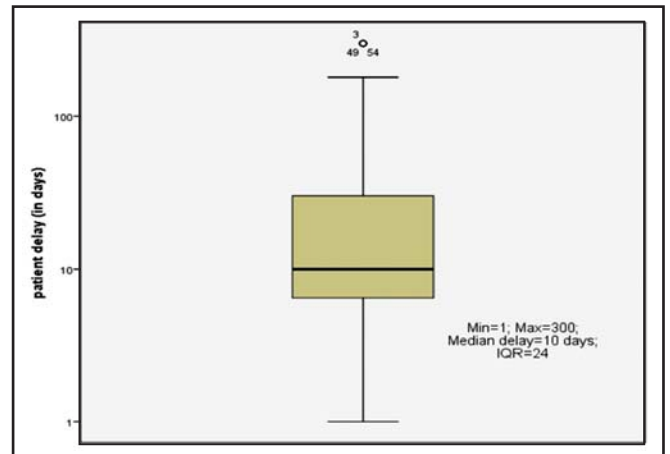
Figure 4: Box and whisker plot showing total delay in days

the first contact with a doctor/medical facility after the onset of symptoms. This time period from onset of the first symptom was studied to the first visit to a doctor is termed as a patient delay. However, recall bias can be introduced by patients by not correctly remembering the time of their first symptoms, and avoidance of such bias is impossible. About 45.7% of the cases reported to a doctor within one week of their symptoms while as 12.9% of the cases had a patient delay of more than 3 months. The mean of the patient delay was 45.6 days. Seyed Nejat Hosseini et al in Iran, found that the mean length of patient delay in stomach cancer was 15.01 days.[4] In this study, though the symptoms of stomach cancer were very varied, there was only a short delay for most of the patients before seeking medical advice, the median delay being of 10 days and an Interquartile range (IQR)= 24. These results are in agreement with a study conducted by Seyed Nejat Hosseini et al in Iran in which they found a median patient delay of 8 days.[4] However, in another study conducted by Haugstvedt TK in Norway, the median patient delay was of 42 days.[8]

Distribution of cases as per the time taken from the onset of symptoms till the final diagnosis was evaluated in present study. This time period from onset of symptoms till diagnosis is referred to as total delay. Around 15.5% of the cases were diagnosed within one month of their symptoms while as 3.4% of the cases had a total delay of more than 12months. Haugstvedt TK in Norway found that 11% of the patients had a total delay of more than 12 months.[8] In current study, the mean of the total delay was 20.16 weeks(140.7 days) which is similar to the

mean of total delay of 121.5 days observed by Seyed Nejat Hosseini et al in Iran.[4] The median total delay was 20 weeks (140 days) with an Interquartile range of 17 in current study. These results are in accordance with a study conducted by Mikulin T et al in which the median total delay was 22 weeks with an Interquartile range of 19.[7] However, in a study conducted by Haugstvedt TK et, the median total delay was 107 days[8] and in a study by Seyed Nejat Hosseini et al, the median total delay was 96 days.[4] The increased total delay in our study may be attributed to the patient's failure to take the symptoms seriously initially and not following up with the doctor regularly.

The present study also found that both patient and system related factors were responsible for causing delay in stomach cancer patients. The patient related factors mainly included the patient's failure to take the symptoms seriously initially and not following up with the doctor regularly. Hospital related factors include duplication of investigations, fully investigating iron-deficiency anaemia as many patients presented with pallor and initial misdiagnosis. However, Doctors can contribute to overall delay by failing to keep a high level of suspicion for stomach cancer and delay in referral to an endoscopist. Similar findings were reported in literature also. [9,10]

Conclusion:

Total delay in diagnosis of stomach cancer was higher than expected. Since stomach cancer has high mortality and morbidity rates creating awareness among the population and training of physicians regarding timely referral of patients seems important. It is essential to educate the common mass regarding the early signs and symptoms of stomach cancer. At the same time, secondary delays need to be avoided by directly visiting the physician after the onset of symptoms. This will contribute to increasing the survival rate for the disease.

Recommendations:

Screening plans for early diagnosis of stomach cancer are required so as to ensure early diagnosis of this disease, thereby reducing the delay, and consequent mortality caused by this disease. Further studies are required to study the factors associated with various types of delay and act thereupon.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References:

1. Qurieshi MA, Khan SMS, Masoodi MA, Qurieshi U, Ain Q, Jan Y, et al. Epidemiology of Cancers in Kashmir, India: An Analysis of Hospital Data. Adv Prev Med. Volume 2016;1–6.

2. International Agency for Research on Cancer. Stomach cancer: Globocan 2018. Glob cancer Obs. 2018;876:1–2. Available from: http://gco.iarc.fr/today. Last accessed on 14 November 2022.

3. Katoch V.Consensus Document for Management of Gastric cancer. Indian Counc Med Res New Delhi. 2014;11–13.

4. Hosseini SN, Mousavinasab SN, Moghimi MH, Fallah R. Delay in diagnosis and treatment of gastric cancer: From the beginning of symptoms to surgery - An Iranian study. Turkish J Gastroenterol. 2007;18(2):77–81

5. Bołdys H, Marek TA, Wanczura P, Matusik P, Nowak A. Even young patients with no alarm symptoms should undergo endoscopy for earlier diagnosis of gastric cancer. Endoscopy. 2003 Jan;35(1):61-67.

6. Saleem SM. Modified Kuppuswamy socioeconomic scale updated for the year 2019. Indian J Forensic Community Med. 2019;6(1):1–3.

7. Mikulin T, Hardcastle JD. Gastric cancer-delay in diagnosis and its causes. Eur J Cancer Clin Oncol. 1987;23(11):1683–90.

8. Haugstvedt TK, Viste A, Hide GE, Soreide O. Patient and physician treatment delay in patients with stomach cancer in Norway: Is it important? Scand J Gastroenterol. 1991;26(6):611–9.

9. Tiwari V, Yogi V, Ghori HU, Singh OP, Peepre K, Yadav S, Mohare C. Identifying the Factors Causing Delayed Presentation of Cancer Patients to a Government Medical College of Central India. J Clin Diagn Res. 2015 Sep;9(9):XC09-XC12.

10. Hatamian S, Etesam S, Mazidimoradi A, Momenimovahed Z, Salehiniya H. The Barriers and Facilitators of Gastric Cancer Screening: a Systematic Review. J Gastrointest Cancer. 2021 Sep;52(3):839-845.

A Study on Depression Experienced by Information Technology Professionals in a Private Company at Chennai, Tamil Nadu, India

Pricella Simaon[1], Anjugam Sugavanam[2], Charumathi Boominathan[3], Gomathy Parasuraman[4], Timsi Jain[5]

[1]Associate Fellow of Industrial Health (AFIH) student, [2]Postgraduate student, [3]Senior Resident, [4]Professor, Department of Community Medicine, Saveetha Medical College and Hospital, Thandalam, Chennai, Tamil Nadu, India.
[5] Professor, Department of Community Medicine, Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India.

Correspondence : Dr. Charumathi Boominathan, Email: jothicharu1995@gmail.com

Abstract:

Introduction : In the past 30 years, there had been more than 916 Information Technology (IT) providers registered with National Association of Software and Service companies. Career in the IT field warrants struggles with deadlines, working at odd and long hours and poor inter-personal relationships all affecting the mental wellbeing of workers. **Objective:** To assess the levels of depression and its associated factors among IT Professionals. **Method:** A cross sectional study, among 170 IT professionals in Chennai. Interview was conducted collecting socio demographic details and Patient Health Questionnaire (PHQ - 9) was used to assess the depression levels. Descriptive statistics were computed for background variables. Association between various factors and levels of depression were analyzed using chi square test. Multiple logistic regression was performed to identify independent risk factors. **Results:** Among the participants, majority 83 (48.8%) were between 21 – 30 years and 95 (55.9%) had work experience > 5 years. Most of them worked on day shifts 105(61.8%). A total of 60 (35.3%) participants had mild and 46 (27%) participants had moderate depression level. These risk factors when compared with depression, it was found that age, gender and working years were found to be significant. ($p<0.05$). **Conclusion:** In present study, $2/3^{rd}$ of the participants had mild to moderate depression levels. It is necessary to increase the active depression management counseling services.

Key Words : Depression, IT Professionals, Patient Health Questionnaire, Risk factors.

Introduction:

In the past 30 years, starting from the 1990s, there has been a consistent demand for Information Technology (IT) at the global level. India has been the biggest out sourcer of IT professionals to the developed countries. There are more than 916 IT providers registered with the National Association of Software and Service Companies (NASSCOM).[1] There has been a significant improvement in the quality of life with the boom of information technology as it has notably improved the employability environment of the country. On one hand, IT jobs provide a hefty salary, good quality of life, chance to travel and work outside of the country. However, on the flip side, IT professionals must deal with very demanding deadlines and update themselves on constantly changing technologies and methodologies.[2]

Long working hours are unwritten mandates of professionals in the field of IT. This has a very

negative impact on health as it leads to loss of sleep and cause fatigue reducing their workplace efficiency. [3] Research has also shown that the work-family-conflict is higher among IT professionals when compared to employees of other professions. This fast paced, stressful profession can increase the overall depression that the person experiences.[4]

Depression is a disorder of the mind that can affect the overall well-being of the individual. Though, even normal person experiences sadness and gloom, a person with depression will experience feelings that interfere with their performance of everyday activities. Depression is a common illness worldwide, with an estimated 3.8% of the population affected, including 5% among adult population. [5]

The World Health Organization (WHO) states that an unfavorable work environment can result in physical and mental health issues, absenteeism, lost effectiveness, usage of substance abuse.[5]

Career in the IT field warrants struggles with deadlines, pleasing multiple stakeholders, frequent modifications in the hierarchy, working at odd hours, working for long hours and poor inter-personal relationships at both the personal and professional front all leading to extreme depression which in turn is the root cause for many physical, mental, and emotional problems.[6] The above-mentioned facts necessitate the need to measure the depression levels and its association with various study variables.

Method:

This cross-sectional study was conducted among IT professionals from a private company in Chennai, India from December 2021 to January 2022. A sample size of 170 was obtained by taking the prevalence of depression from a study done in India [P – 51.2%, Q = 100 – P; Q = 48.8%, Relative precision of 15%].[7] After obtaining permission from the Managing director, 170 participants were selected among 500 employees by simple random sampling method. IT professionals who were above 21 years

and who gave consent were included in the study. Those who have been diagnosed to have chronic diseases and other mental illness were excluded.

The study participants received a thorough explanation of the study purpose and their informed consent was obtained. The interview schedule was administered by face–to–face interview and information was gathered using a semi-structured questionnaire. Questionnaire consisted of 2 sections.

Section 1: Socio demographic characteristics, working hours, shift of works.

Section 2: Patient Health Questionnaire -9 (PHQ-9).[8,9] The pre-validated 9 item patient health questionnaire (PHQ-9) was used to estimate the levels of depression among the study participants. The questionnaire had nine questions on their feelings in the past 2 weeks and each question had 4 options which were "not at all" (0 points), "several days" (1 point), "more than half the days" (2 points), "nearly every day" (3 points). PHQ -9 ranging from 1 – 27. The recommended depression levels are:

Total Score	Depression Severity
1-4	Minimal depression
5-9	Mild depression
10-14	Moderate depression
15-19	Moderately severe depression
20-27	Severe depression

The data obtained was analyzed using SPSS 22.0. Descriptive statistics were computed for background study variables. Chi – Square test was used to find the association between various study variables with depression. Multiple Logistic Regression (MLR) analysis was performed to identify independent risk factors. Institutional Ethical Committee approval was obtained from Private Medical College in Kancheepuram District (SMC/IEC/2022/01/025).

Results:

The mean age of the participants was 32.59 ± 7.3 years, among them 114 (67.1%) were males, in the

Table 1: Socio-Demographic Profile of the Study Participants

Variable	Frequency (%) (N = 170)
Age	
21 – 30 years	83 (48.8%)
31 – 40 years	61 (35.9%)
41 – 50 years	22 (12.9%)
>50 years	4 (2.4%)
Gender	
Males	114 (67.1%)
Females	56 (32.9%)
Type of family	
Joint family	39 (22.9%)
Nuclear family	124 (73%)
Three generation family	7 (4.1%)
Place of residence	
Hostel	20 (11.8%)
Relative's home	4 (2.4%)
Staying with family	146 (85.8%)
Marital status	
Married	111 (65.3%)
Separated	13 (7.6%)
Single	46 (27.1%)
Socio-economic status*	
Middle	4 (2.4%)
Upper middle	91 (53.5%)
Upper	75 (44.1%)
Personal Habits	
H/O smoking/ Alcoholism/ Tobacco chewing	66 (38.8%)
No habits	104 (61.2%)
Duration of sleep	
< 8 hours	72 (42.4%)
> 8 hours	98 (57.6%)

* Modified BG Prasad Classification 2021[10]

age group 21-30 years (48.8%). Majority 111 (65.3%) of study participants were married. 66 (38.8%) of participants were found to have personal habits in the form of smoking, alcoholism and tobacco chewing. 72 (42.4%) participants had a sleep duration of below 8 hours (Table 1)

Around 95 (55.9%) study participants were having work experience of more than 5 years, and 75 (44.1%) had experience less than 5 years. 51 (30%) were working only in mixed shifts and 105 (61.8%) were working on day shifts alone.

Based on PHQ – 9, (35.3%) 60 participants had mild depression and 42 (24.7%) had minimal depression. (Figure 1)

Figure 1: Levels of Depression among Study Participants (N = 170)
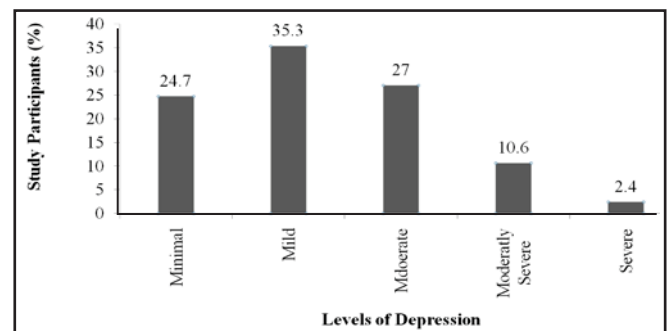
Subjects with PHQ-9 score less than or equal to 4 were taken as subjects with no depression, and subjects with scores above 4 were taken as subjects with depression. There was statistically significant association between presence of depression and age above 35 years, female gender, work experience greater than 5 years. However, the other associations were not statistically significant. (Table 2)

The factors which were significant were taken for further analysis by multiple logistic regression with low-risk group as reference category. On analysis no variables were found to be independent risk factor associated with depression (p value < 0.05). (Table 3)

Discussion:

The study was done to estimate the levels of depression and to identify the factors associated with

Table 2: Association between Depression and its Risk Factors among Study Participants

Variables	Depression		Total (N = 170)	p value
	Present (n= 128)	Absent (n= 42)		
Age				
≤ 35 years	80 (70%)	36 (30%)	116	**0.005***
> 35 years	48 (88.9%)	6 (11.1%)	54	
Gender				
Male	80 (70.2%)	34 (29.8%)	114	**0.027***
Female	48 (85.7%)	8 (14.3%)	56	
Work years				
> 5 years	78 (82.1%)	17 (17.9%)	95	**0.020***
≤ 5 years	50 (66.7%)	25 (33.3%)	75	
Hours of sleep				
≥ 8	70 (71.4%)	28 (28.6%)	98	**0.173**
< 8	58 (80.6%)	14 (19.4%)	72	
Socio-economic status (According to BG Prasad Scale)				
Middle & Upper middle class	72 (75.8%)	23 (24.2%)	95	**0.866**
Upper class	56 (74.7%)	19 (25.3%)	75	
Shift timing				
Day	75 (71.4%)	30 (28.6%)	105	**0.139**
Mixed & Night	53 (81.5%)	12 (18.5%)	65	
Residence				
At home	109 (74.7%)	37 (25.3%)	146	**0.826**
Away from home	19 (79.2%)	5 (20.8%)	24	
History of Substance Use				
Yes	52 (78.8%)	14 (21.2%)	66	**0.402**
No	76 (73.1%)	28 (26.9%)	104	
Type of family				
Nuclear	92 (74.2%)	32 (25.8%)	124	**0.585**
Joint/Three generation	36 (78.3%)	10 (21.7%)	46	
Marital status				
Married	88 (79.2%)	23 (20.8%)	111	**0.098**
Unmarried	40 (67.7%)	19 (32.3%)	59	

* p value<0.05- Statistically significant; p value obtained from Chi Square Test

Table 3: Multiple Logistic Regression of Risk Factors and Depression

Variables	p value	OR	95% Confidence Interval
Age <35 years® >35 years	0.069	0.348	0.11 – 1.04
Gender Male® Female	0.05	0.421	0.17 – 1.00
Work years < 5 years® > 5 years	0.506	1.333	0.57 – 3.10

*p value<0.05 Statistically significant, ® Reference category

depression among the information technology (IT) Professionals.

The results of the overall study showed that majority of the participants were found in the age group of 20 – 30 years (48.8%) which is similar to the study done in IT company Bangalore by Ramesh et al.[11] When compared to men 80 (70.2%), women 48 (85.7%) were more likely to experience depression; however, some studies questioned [8] the results of the current study while others supported them.[12,13] In a study done by Gandhi et al.[14] 111 (35.8%) of IT professionals had mild and 11 (3.5 %) had severe depression which was not in line with current study. The difference was due to usage of different scales to assess the depression levels.

In the current study, there was statistically significant association between depression and age more than 35 years, female gender, work experience greater than 5 years. This was different from the results found from a study done on IT professionals in Delhi in which there was statistically significant association between depression and marital status, family type. [14]

There was no association between depression and substance use which is contrary to other studies.[15,16] Further comparisons could not be made

because of lack of similar studies on information technology employees.

An important wake-up call on the need for policies to address the issue is provided by the current poll, which showed significant levels of depression among Chennai's IT professionals. Poor depression management may have detrimental impacts on the IT employees physical and mental health. It is time to put depression management procedures into place. [17]

Conclusion:

Mild levels of depression (35.3%) were found in employees in Chennai's IT sector. When comparing the risk factors and depression age, gender distribution and working of the study participants were found to be statistically significant. Mental health issues like depression should be given attention along with the notifiable diseases that the employees are routinely examined for as they would eventually have an impact on the person's general health.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References:

1. Rao SK, Bhat M, David J. Work, stress, and diurnal bruxism: a pilot study among information technology professionals in Bangalore City, India. International Journal of Dentistry. 2011 Dec 10;1:1-5.

2. Archana PS, Das S, Philip S, Philip RR, Joseph J, Punnoose VP, Lalithambika DP. Prevalence of depression among middle aged women in the rural area of Kerala. Asian journal of psychiatry. 2017 Oct 1;29:154-9.

3. Tsuchiya M, Takahashi M, Miki K, Kubo T, Izawa S. Cross-sectional associations between daily rest periods during weekdays and psychological distress, non-restorative sleep, fatigue, and work performance among information technology workers. Industrial health. 2017 Mar 31;55(2):173-9.

4. DePasquale N, Polenick CA, Davis KD, Moen P, Hammer LB, Almeida DM. The psychosocial implications of managing work and family caregiving roles: Gender differences among information technology professionals. Journal of family issues. 2017 Aug;38(11):1495-519.

5. Depression. World Health Organization [Internet]. Available at: https://www.who.int/news-room/fact-sheets/detail/depression [cited 2022 Nov 16].

6. Vimala B, Madhavi C. A study on stress and depression experienced by women IT professionals in Chennai, India. Psychology research and behavior management. 2009;2:81-91.

7. Darshan M, Raman R, Sathyanarayana Rao T, Ram D, Annigeri B. A study on professional stress, depression and alcohol use among Indian IT professionals. Indian J Psychiatry. 2013;55(1):63–9.

8. Obadeji A, Oluwole L, Dada M, Ajiboye A, Kumolalo B, Solomon O. Assessment of depression in a primary care setting in Nigeria using the PHQ-9. J Fam Med Prim Care. 2015;4(1):30-34.

9. Cameron IM, Crawford JR, Lawton K, Reid IC. Psychometric comparison of PHQ-9 and HADS for measuring depression severity in primary care. Br J Gen Pract. 2008 Jan;58(546):32–6.

10. Majhi MM, Bhatnagar N. Updated BG Prasad's classification for the year 2021: consideration for new base year 2016. Journal of Family Medicine and Primary Care. 2021 Nov 1;10(11):4318-4319.

11. Ramesh N, Joseph B, Kiran PR, Kurian J, Babu AT. Perceived professional stress levels among employees in an Information Technology Company, Bangalore. National Journal of Community Medicine. 2016 Apr 30;7(04):231-4.

12. Shrivastava SR, Bobhate PS. Computer related health problems among software professionals in Mumbai: A cross-sectional study. International Journal of Health & Allied Sciences. 2012 Apr 1;1(2):74.

13. Padma V, Anand NN, Gurukul SMGS, Javid SMASM, Prasad A, Arun S. Health problems and stress in Information Technology and Business Process Outsourcing employees. Journal of Pharmacy AndBioallied Sciences. 2015 Apr 1;7(5):9.

14. Gandhi PA, Kishore J. Prevalence of depression and the associated factors among the software professionals in Delhi: A cross-sectional study. Indian Journal of Public Health. 2020 Oct 1;64(4):413.

15. Vasquez EP, Gonzalez-Guarda RM, De Santis JP. Acculturation, Depression, Self-Esteem, and Substance Abuse among Hispanic Men. Issues Ment Health Nurs. 2011;32(2):90–7.

16. Sharma AK, Khera S, Khandekar J. Computer related health problems among information technology professionals in Delhi. Indian journal of community medicine. 2006 Jan 1;31(1):36.

17. Sabbarwal S, Singh MM, Amiri M. Occupational stress on employees in information technology organizations. Asian journal of social sciences & humanities. 2017 Aug;6(3):104-10.

Challenges Faced in Biomedical Waste Management by Waste Handlers amidst the COVID-19 Pandemic in a Tertiary Care Hospital: A Qualitative Study

Anuradha Kunal Shah[1], Yuvaraj B Chavan[2], Nived G Sudarson[3], Sagar K Sontakke[3]

[1]Assistant Professor, [2]Professor, [3]Junior Resident, Department of Community Medicine, Seth GS Medical College and KEM Hospital, Mumbai, India

Correspondence : Dr. Nived G Sudarson, Email:nivedgsudarson@gmail.com

Abstract:

Introduction : Coronavirus disease 2019(COVID-19) saw an overhaul in the biomedical waste management (BMWM) practices. Waste handlers were at the brunt of these changes. If the challenges pertaining to BMWM at the ground level are better understood, more effective measures to overcome them can be formulated. **Objectives:** 1. To identify myths and concerns regarding BMWM in the context of COVID-19 pandemic. 2. To explore the challenges faced in BMWM amidst the COVID-19 pandemic. 3.To explore opportunities and future perspectives of BMWM. **Method:** In-depth interviews were conducted among 17 purposively selected Class IV health care workers during August to November 2021 in a tertiary care institute in Mumbai. Data was reported using thematic analysis. **Results:** Three major themes - challenges and concerns faced by BMW handlers, enablers/ motivators, opportunities and future practices were generated from the transcripts. Various challenges faced by waste handlers were- difficulties in segregation and transport of BMW, exhaustion from PPE usage and fear of acquiring and spreading COVID-19 from work, stigma faced from public, and handling COVID-19 deaths. Support from family and colleagues, incentives and a positive change in public perception enabled them to work. Forming redressal committees, addressing job security concerns and timely provision of good quality equipment can improve hospital waste management measures in the future. **Conclusion:** It is of utmost importance to address challenges faced by waste handlers in BMWM. Onus should also be on periodic training in BMWM.

Key Words : Bio Medical Waste, COVID-19, Pandemic, Waste Management.

Introduction:

Hospital Waste Management involves a range of activities, such as collection, transportation, operation or treatment of processing systems, and disposal of waste.[1] Safe and sustainable management of biomedical waste(BMW) is a social and legal responsibility of all associated with health care services. In developing countries like India, appropriate BMW management following stipulated rules[2,3] has been one of the neglected aspects of healthcare for years. Poor conduct and inappropriate disposal methods in handling BMW pose significant health hazards and environmental damage due to the infectious nature of the waste.[4] Amidst the COVID-19 pandemic, the scenario may have worsened with piles of personal protective equipment (PPE) accumulating in the hospitals. [5]

The Central Pollution Control Board (CPCB), India, published guidelines for the management of waste generated during the treatment/ diagnosis/

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Shah A, Chavan Y, Sudarson N, Sontakke S. Challenges Faced in Biomedical Waste Management by Waste Handlers amidst the COVID-19 Pandemic in a Tertiary Care Hospital: A Qualitative Study. Healthline. 2022; 13(4): 307-312.
	DOI : 10.51957/Healthline_450_2022	

quarantine of COVID-19 patients. These guidelines advocated the use of double layered bags, mandatory labelling of bags and containers as "COVID-19 waste," regular disinfection of dedicated trolleys, and separate record keeping of waste generated from COVID-19 isolation wards, in addition to the recommendation for following existing practices of BMW Management Rules, 2016.[6]

A proposed rise in the generation of hospital waste due to rigorous sanitation practices triggered by the pandemic, shortage in manpower and a multitude of other factors resulted in an overhaul in BMW management practices.[7] This may have resulted in improper BMW management practices leading to a rise in hospital-acquired infections (HAI).[8] This study aims to explore the myths and concerns, and challenges in BMW management faced by the waste handlers amidst the COVID-19 pandemic. Additionally, changes in practices with the advancement of the pandemic, opportunities and future perspectives of BMW management were also identified.

Method:

This qualitative study using in-depth interviews (IDI) was conducted in a tertiary care institute in Mumbai, Maharashtra, India from August to November 2021. The ethical approval was obtained from the Institutional ethics committee [EC/OA-49/2021]. Class IV workers who were employed in the institute for at least the past two years were included. Workers who were not posted in any COVID-19-related setting were excluded from the study. To identify the challenges in different avenues healthcare providers working in the outpatient department including fever screening, inpatient department, isolation ward, intensive care unit, laboratory etc. where BMW is generated were purposively selected. Data saturation was achieved after 17interviews. All interviews were conducted by a senior researcher with a post graduate degree in public health [Author 1(A1)]. One among the other authors[A2, A3, A4] took running notes during the interviews. The room was closed for privacy. There

was no interference faced during any of the interviews. Confidentiality and anonymity were assured to each participant. Written informed consent was taken from each participant. Interviews were audio recorded after collecting baseline data. No incentives were provided to any participant. Each interview lasted for a period of about 30-40 minutes. For better comprehension the interviews were conducted in the language comfortable to the study participants (Marathi/Hindi). The transcripts were prepared in Hindi/Marathi based on the notes of the IDI and audiotapes. They were then translated to English. Thematic analysis of the transcripts was done. It was coded using the Microsoft word comment feature. Two investigators (A1 and A3) were involved in coding. Individual coding was done by A3 and agreement coding was done by A1. A predominant deductive approach was used to code the IDI transcripts. Both de novo and in vivo types of codes were used. Relationships between codes were identified. Themes and categories were drawn from it.

Results:

A total of 17 in-depth interviews were conducted. The baseline characteristics are shown in table 1. Mean age of participants and mean years of work experience in the institute were 34.67 ± 6.65 years and 8.92 ± 7.88 years respectively, with male to female ratio 1: 0.41. All of them took COVID-19 vaccination whereas Hepatitis-B vaccination was taken by only 58.3% of study participants. Thematic analysis of the transcripts led to the development of three major themes.

Theme 1: Challenges and concerns faced by BMW handlers

The pandemic came with many uncertainties leading to concerns and challenges at the workplace. Availability and procurement of PPE did not feel difficult for the participants. As the pandemic progressed the risk perception of the disease decreased over time, which in turn led to a fall in PPE utilization by the HCWs. Occasionally good quality PPE as well as well fitting PPE would be difficult to

obtain. Wearing PPE for long durations caused physical exhaustion and dehydration due to sweating. A participant (PID 5) narrated this as "PPE was easy to get, but sometimes only smaller sizes were available. They get torn while I use…". Pandemic also affected their mental well being. One such situation came out during the interview when a participant (PID 7) himself narrated "A few neighbours told me not to come home. Some didn't say, but they maintained distance...". The major categories under this theme are explained in Table 2.

Theme 2: Enablers/ Motivators

Certain factors helped the BMW handlers to continue working during the pandemic despite the challenges. Family support, encouragement and appreciation from colleagues and superiors were motivating factors to continue working during the pandemic. Monetary and non monetary incentives were provided during the pandemic. Such measures included provision of free and timely transport, food packets, COVID allowance and acknowledgement certificates. Participant PID 15 said"…We are like a family here, nurses and us. Bus was also arranged when local trains stopped running..."Availability of PPE at all times provided a sense of security.

For handling and transportingof dead bodies of positive patients body bags were readily available, as reported by participant PID 4"… PPE was for our protection. Even for transferring COVID dead bodies we always got bags ."The major categories under this theme are explained in Table 3.

Theme 3: Opportunities and future practices

All the healthcare workers who participated in this study were willing to work with the same vigour given a similar untoward situation in the future. However, few lacunae and suggestions and emerged from the IDIs . Many participants did not feel the need to attend training provided in BMW management as they were familiar with it. An induction training in BMWM though mandatory, was not attended by all, as reported by PID 1, training was there, but I know everything, so did not attend…". Occasional incidences of bags tearing during handling and transport caused additional discomfort to the participants. Participant PID 16 explained her method to prevent this: "… I routinely use double bags to prevent tear…" The major categories under this theme are explained in Table 4.

Discussion:

Management of BMW during the COVID-19 pandemic has been an unprecedented challenge worldwide. Due to the infectious nature of the pathogen, waste handlers were at a higher risk of contracting and spreading the virus as well as improper waste management could result in the catastrophic spread of the virus.[9] IDIs of HCWs were conducted who were handling BMW in a tertiary care hospital in Mumbai to reveal these challenges. Some of the challenges reported were shortage of manpower during the early stages of the pandemic, improper-sized PPE, physical exhaustion due to prolonged PPE usage, stigma from neighbours, and fear of infecting family members. Other studies among BMW handlers revealed challenges such as inadequate training, poor knowledge regarding colour coding and needle stick injuries.[10]

A key step in COVID-19 waste management is the segregation of BMW from solid waste.[11] Among the several stages involved in BMW management, segregation of the waste was reported as the most challenging step by a majority of our study participants. Difficulty in the collection, as well as transport of the collected waste, was also reported by some study participants. According to a study conducted by Ojha B et al,[12] proper segregation, handling, and disposal remained a serious concern for health care facilities across India during the pandemic and before it as well.

Family support, incentives and a positive public attitude towards work can go a long way to motivate people working in difficult jobs such as handling infectious waste during a pandemic. Amidst the numerous challenges the pandemic presented, certain factors encouraged our study participants to continue their work such as support from family members, friends and acquaintances, monetary and

Table 1: Baseline characteristics of the study participants

Participant characteristics	Descriptive Statistics
Age (years)	34.67 ± 6.65 (27-51)
Years of experience	8.92 ± 7.88 years (2-30)
Male: Female	1: 0.41
Duty hours during pandemic (hours/day)	7.83 ± 0.58 (6-8)
Hepatitis B vaccination	58.33%
COVID-19 vaccination	100%
COVID-19 infection	1 (5.9%)

Table 2: Categories and description under Theme 1: Challenges and concerns faced by BMW handlers

Categories	Description	Verbatim
Manpower	At the beginning of the pandemic, due to uncertainty, there was a shortage of BMW handlers as people went on unprecedented leaves. Many resumed duties after reassurance from peers and official notice to resume work.	"a lot of people ran away initially..."[Participants ID (PID) 2, 28 years (Y) / male(M), 4 years of work experience (YWE)]
PPE	PPE was available most of the time. Procurement was also not a challenge. However, with decreased risk perception, usage was not as much as in the initial days. The procurement of additional PPE on the same day was difficult due to inventory. Sometimes PPE was of inferior quality or wrong size.	"PPE was easy to get, but sometimes only smaller sizes were available. They get torn while I use..."(PID 5, 38Y/M, 10YWE)
Physical Health	Wearing PPE caused sweating, exhaustion and N-95 masks caused breathlessness.	" I sweat profusely, got exhausted and felt breathlessness after wearing N95 for long duration..."(PID 12, 30Y/M, 6YWE)
Mental Health	They faced stigma from neighbours and rarely from superiors at work too. Fear of infecting family members was present.	"A few neighbours told me not to come home. Some didn't say, but they maintained distance..." (PID 7, 33Y/M, 12 YWE)
BMW Segregation and Transportation	Of the whole process involved in waste handling, segregation was most challenging as HCWs when overburdened with more patients, put the waste in the wrong colour-coded bags. Sometimes bags tore during transportation.	"Other staff in ward misplace waste in the wrong bag, very difficult to rearrange..."(PID 11, 51/F, 30 YWE)

non-monetary incentives and appreciation and comradery from doctors, nurses and colleagues.

During the IDIs all the HCWs expressed complete willingness to work with the same diligence in any such untoward future health emergencies, albeit a few suggestions also emerged. An induction training mandatory for all was conducted in the early stages of the pandemic but was not attended by all. Similar studies revealed that impetus should be on regular and compulsory

Table 3: Categories and description under Theme 2: Enablers/ Motivators

Categories	Description	Verbatim
Support and appreciation	Support and appreciation from family, colleagues and superiors were motivating factors for almost all waste handlers.	"Family support and encouragement helped me work in these times..." (PID 6, 31 Y/M, 7YWE)
Incentive	Monetary incentives in the form of Rs. 300/- per day COVID allowance, paid isolation and quarantine leaves were given to all HCWs. Non-monetary incentives like free food packets at work, a 'COVID warrior' certificate, and separate buses to enable transportation during the lockdown and separate accommodation during COVID duties were also provided.	"...We are like a family here, nurses and us. Bus was also arranged when local trains stopped running..." (PID 15, 37Y/ M 10YWE)
PPE availability	PPE was available most of the time which gave a sense of security. Procurement was difficult, rarely. Body bags for dead bodies of positive patients were also readily available.	"... PPE was for our protection. Even for transferring COVID dead bodies we always got bags.(PID 4, 27 Y/M, 3 YWE)"

Table 4: Categories and description under Theme 3: Opportunities and future practices

Categories	Description	Verbatim
Training	There was no felt need for training among participants but, as a new type of waste may be generated with new diseases, it is necessary to undergo training. An induction training mandatory was conducted but, not attended by all.	"Training was there, but I know everything, so did not attend..." (PID 1, 39 Y/M, 17YWE)
Double layer bags/ better quality waste bags	Incidences of torn bags were reported which led to spillage of waste and an increase in workload. Therefore, better quality bags can be provided and double-layered bags can be used till then.	"I routinely use double bags to prevent tear..." (PID 16 33/F, 10 YWE)
Employee redressal	Some HCWs felt there was discrimination between permanent and contractual employees. This can be well managed by a redressal committee. Few HCWs also hope to get a permanent job, post working in the pandemic.	"Convert temporary jobs to permanent jobs as a token for working in COVID..." (PID 8, 30/F, 3YWE)

training for HCWs in handling BMW.[13] Incidences of coded bags tearing while handling / transporting BMW were reported, hence double / better quality bags could be provided. Few participants expressed their discontent to have to continue as temporary employees after working in such demanding circumstances. They also felt discrimination between permanent and temporary employees. Some aspire to get a permanent job as a token for working in the pandemic. Setting up an employee redressal committee at institutional levels could help tackle such grievances. In a qualitative study conducted in a rural tertiary care institute in India, the participants suggested organizational changes, training and monitoring to address the gap in knowledge and practice of waste management.[14]

Waste management is critical to human development and health outcomes. Its significance

rose further during the COVID-19 pandemic. The invaluable service provided by the waste management sector ensures that the unusual heaps of waste that pose health risks and escalate the spread of COVID-19 are avoided. Hence, their needs and challenges need to be explored further. With proper training, appropriate equipment, de-stigmatization, encouragement and multi disciplinary coordination, many of these challenges can be overcome and safe and effective BMW management be ensured.

Conclusion:

This study has important implications regarding policy making and implementation of BMW management rules and strict adherence to it especially during outbreaks of infectious diseases. Compulsory periodical training in BMW management is necessary along with availability of appropriate good quality equipment and provisions for employee redressal. Analytical studies to study the effectiveness of the BMW management training could be done. This study provides an insight into the challenges faced by waste handlers such as shortage of manpower during the early stages of a pandemic, improper-sized PPE, physical exhaustion and fear of infecting family members. Challenges pertaining towards segregation of waste as well as stigma faced by the waste handlers during the pandemic were reported in the study. The waste management sector is one of the most stigmatized and underappreciated jobs in healthcare. Skill development, targeted training and grievance redressal for waste handlers could improve compliance with guidelines and thereby reducing transmission of diseases and environmental spread of hazardous material from Bio-medical waste.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References:

1. Mathur P, Patan S, Shobhawat A S. Need of Biomedical Waste Management System in Hospitals – An Emerging issue – A Review. Current World Environment 2012;7(1):117–24.

2. CPCB. Central Pollution Control Board [Internet]. [Cited 2022 Dec 26]; Available from: https://cpcb.nic.in/bio-medical-waste-rules/

3. The Bio-Medical Waste Management (Amendment) Rules, 2018 - India Environment Portal News, reports, documents, blogs, data, analysis on environment & development India, South Asia [Internet]. [Cited 2022 Dec 28];Available from: http://www.indiaenvironmentportal.org.in/content/453336/the-bio-medical-waste-management-amendment-rules-2018/

4. Hossain MS, Santhanam A, Nik Norulaini NA, Omar AKM. Clinical solid waste management practices and its impact on human health and environment--A review. Waste Manag 2011;31(4):754–66.

5. Rajak R, Mahto RK, Prasad J, Chattopadhyay A. Assessment of bio-medical waste before and during the emergency of novel Coronavirus disease pandemic in India: A gap analysis. Waste Management and Research 2022;40(4):470–81.

6. CPCB | Central Pollution Control Board [Internet]. [Cited 2022 Jun 6];Available from: https://cpcb.nic.in/bio-medical-waste-rules/

7. Andeobu L, Wibowo S, Grandhi S. Medical Waste from COVID-19 Pandemic—A Systematic Review of Management and Environmental Impacts in Australia. Int J Environ Res Public Health 2022;19(3):1–15.

8. Weiner-Lastinger LM, Pattabiraman V, Konnor RY, Patel PR, Wong E, Xu SY, et al. The impact of coronavirus disease 2019 (COVID-19) on healthcare-Associated infections in 2020: A summary of data reported to the National Healthcare Safety Network. Infect Control Hosp Epidemiol 2022;43(1):12–25.

9. Behera BC. Challenges in handling COVID-19 waste and its management mechanism: A Review. Environ Nanotechnol Monit Manag 2021;15:100432.

10. Mohammed Ismail I, Kulkarni AG, Kamble S V, Borker SA. Knowledge, attitude and practice about bio-medical waste management among personnel of a tertiary health care institute in Dakshina Kannada, Karnataka. Al Ameen J Med Sci 2013;6(4):376–80.

11. Capoor MR, Parida A. Current perspectives of biomedical waste management in context of COVID-19". Indian J Med Microbiol 2021;39(2):171–8.

12. Das A, Garg R, Ojha B, Banerjee T. Biomedical Waste Management: The Challenge amidst COVID-19 Pandemic. J Lab Physicians 2020;12(02):161–2.

13. Kumar R, Shaikh BT, Somrongthong R, Chapman RS. Practices and challenges of infectious waste management: A qualitative descriptive study from tertiary care hospitals in Pakistan. Pak J Med Sci 2015;31(4):795–8.

14. Joshi SC, Diwan V, Joshi R, Sharma M, Pathak A, Shah H, et al. "How Can the Patients Remain Safe, If We Are Not Safe and Protected from the Infections"? A Qualitative Exploration among Health-Care Workers about Challenges of Maintaining Hospital Cleanliness in a Resource Limited Tertiary Setting in Rural India. Int J Environ Res Public Health [Internet] 2018 [cited 2022 Jun 1];15(9):1660–4601.

A Study of Determinants of Low Birth Weight in Newborns Delivered at One of the Tertiary Care Hospitals in Saurashtra Region, Gujarat

Harsh Patel[1]**, Jitesh Mehta**[2]**, Bela Patel**[1]**, Rohitkumar Ram**[3]**, Dipesh Parmar**[4]

[1]Senior Resident, [2]Professor, [3]Associate Professor, [4]Professor and Head, Department of Community Medicine, Shree M.P. Shah Govt. Medical College, Jamnagar

Correspondence : Dr. Harsh Patel, Email: harsh1361994.hp@gmail.com

Abstract:

Introduction : Birth weight is one of the most important criteria for determining neonatal and infant survival and is considered a sensitive index of the nation's health and development. The World Health Organization (WHO) defines low birth weight (LBW) as "Birth weight less than 2500 grams" regardless of gestational age, the measurement being taken preferably within the first hour of life. **Objectives :** 1)To estimate the prevalence of LBW among sample population at tertiary care hospital. 2)To study the distribution of newborns, according to socio-demographic characteristics of the mother and its association with LBW. **Method:** A hospital based cross-sectional study was carried out among 500 newborns between December 2020 and November 2021. Participants were selected by systematic random sampling technique. The data were collected from the case file and face-to-face interview. Both descriptive and inferential statistics were used in the analysis. **Results:** Prevalence of low birth weight was 29.2%. Majority 271 (54.2%) of newborn mothers' age group was between 21 to 25 years. More than half 272 (54.4%) newborns were from mothers who studied up to primary level education and more than three forth 389 (77.8%) were from mothers who were housewives. Majority 293 (58.6%) of newborns were from the urban area, around three forth 382 (76.4%) newborns were Hindu and nearly two fifth 194 (38.8%) newborns belonged to lower middle class. Prevalence of low birth weight was significantly higher in mothers aged >35 years and ≤ 20 years, who were illiterate, doing labour work and belonging to lower socio-economic class. **Conclusion:** The prevalence of Low Birth Weight was 29.2% among sample population. Socio-demographic variables like maternal age >35 years, ≤ 20 years, illiteracy, labour work and lower socio-economic class had shown significant risk for delivering Low Birth Weight babies.

Key Words : Low birth weight, Newborn, Socio-demographic factors, Tertiary care Hospital

Introduction:

Birthweight is the first weight of the new born obtained after birth. For live births, birthweight should preferably be measured within the first hour of life, before significant post-natal weight loss has occurred.[1] Birth weight is one of the most important criteria for determining neonatal and infant survival and is considered a sensitive index of the nation's health and development.[2]

The World Health Organization (WHO) defines low birth weight (LBW) as "Birth weight less than 2500 grams" regardless of gestational age, the measurement being taken preferably within the first hour of life.[2] LBW includes both appropriately

grown preterm neonates (<37 completed weeks of gestation), term neonate and also in preterm growth-restricted neonates (<10th centile of weight for gestational age and sex) but remains an important public health indicator, especially in settings where accurate gestational age assessment is not possible.[3] It is estimated that the risk of neonatal mortality for LBW infants is 20 times more than for infants with birth weight exceeding 2500 grams, and it increases sharply as birth weight decreases.[4] According to health and family welfare statistics, 48.1% causes of deaths within first 29 days and 35.9% causes of death within 1 year of birth were occurred due to the prematurity & low birth weight.[5]

According to the National Family Health Survey (NFHS-4), about 18% of Indian children younger than five years are born with LBW in 2015–16.[6] LBW among infants were highest in the Central region of India (20.73%). The prevalence of LBW cases was 20.64% in the Northern region and 20.43% in the Western region. Comparatively, the rate was approximately 18.15%, 16.40% and 9.87% in the Southern, Eastern, and North-east regions, respectively. The prevalence of LBW cases among the infants born in urban areas was 16.75% while the cases of LBW were 17.72% among the infants born in rural sectors.[7] Being born with a low birth weight also incurs enormous economic costs, including higher medical expenditures and social service expenses, and decreased productivity in adulthood.[8]

Socio-demographic characteristics such as socioeconomic status, parent's education, maternal age, and maternal occupation during pregnancy are also found to be associated with LBW. Social factors might also have an impact on the psychology of pregnant women and can thereby affect the pregnancy outcome.[9] With this background, this research was conducted to estimate the prevalence of LBW among sample population at tertiary care hospital and to study association of various socio-demographic determinants with low birth weight.

Method:

An institutional based cross-sectional study design in which all three Post-natal wards of Gynaecology Department at tertiary care government hospital, Jamnagar were selected. Study duration was 12 months from December 2020 to November 2021. The study population consists of newborns of postnatal mothers delivered at a tertiary care hospital. The sample size estimation was done taking 5% alpha error at 95% CI by using equation $N = Z^2_{(1-\alpha/2)} pq / l^2$ [Where, N = Desired sample size, $Z_{(1-\alpha/2)}$ at 95%CI = 1.96, p = prevalence of LBW in the studied institution in the previous year which was 27% = 0.27, q = (1-p) =73% = 0.73, l = max. allowable error which is taken as 15% of p which is 0.04]. Now, $N = (1.96)^2\ 0.27{\times}0.73/ (0.04)^2 = 473.12 \approx 474$. Taking 5% as non response rate sample size would be 474+24 = 498. So, the estimated final sample size was 500.

Systematic random sampling technique were employed for selecting participants. By considering total numbers of deliveries in previous 3 months of the study and sample size, the sampling interval (3) was obtained. In gynaecology department each unit was visited on post emergency day and every third mother indoor in postnatal ward was selected as our study participant. If the mother doesn't give consent to participate in the study, mother next to that was selected. Singleton live newborns of Postnatal mothers, Newborns' mothers who were willing to participate, Informant and participants must be free from any severe, debilitating and mental illness were included. Newborns' mothers who were not willing to participate, Twins and Still births were excluded from the study.

For the Data collection a predesigned, pre-tested and semi-structured questionnaire was used. The information regarding the study variables like mothers' and fathers' age, education, occupation, residential area, religion, type of family and socio economic class were collected. For Socio economic class modified BG Prasad classification (revised for

year 2020, CPI-330)[10] was used. The guardians(mothers) were interviewed by visiting PNC wards and explained in detail about the study. Informed consent was taken before starting data collection. The data was collected from the case file and face-to-face interview. Collected data were compiled in Microsoft excel sheet, after that data was analysed in SPSS software version 26. Both descriptive and inferential statistics were used in the analysis. In descriptive statistics frequency and percentage were computed. Proportion of low birth weight was determined first and LBW proportion associated with each factor was computed by chi-square test. Statistical significance was set at the probability value ($p < 0.05$). Ethical clearance from institutional ethics committee was sought prior to the study. The participant's consent was obtained first after explaining the purpose of the study.

Results:

In present study, prevalence of low birth weight was 29.2% in sample population (N=500) while 70.8% was normal or above normal weight newborns. (Figure 1) Mean birth weight of newborn babies was 2.7 kg.

Mean age of the newborns' mothers in the study was 25.1 year. Table 1 shows, 271 (54.2%) of newborns belonged to mothers age group 21 to 25 years. More than half 272 (54.4%) and 222 (44.4%) of newborns belonged to mothers and fathers respectively, who were studied up to primary level education. More than three fourths 389 (77.8%) newborns mothers were housewives. Majority 314 (62.8%) of newborns' fathers were labourer. Majority 293 (58.6%) of newborns were from the urban area, 382 (76.4%) were Hindu and 244 (48.8%) were from three generation family.Majority newborns belonged to lower middle 194 (38.8%) and middle class164 (32.8%) according to Modified BG Prasad classification(Revised for year 2020).

Figure 2 shows that the prevalence of LBW was significantlly higher in mothers' age group > 35 years and ⩽ 20 years.Prevalence of low birth weight was

Figure 1: Distribution of newborns' according to birth weight
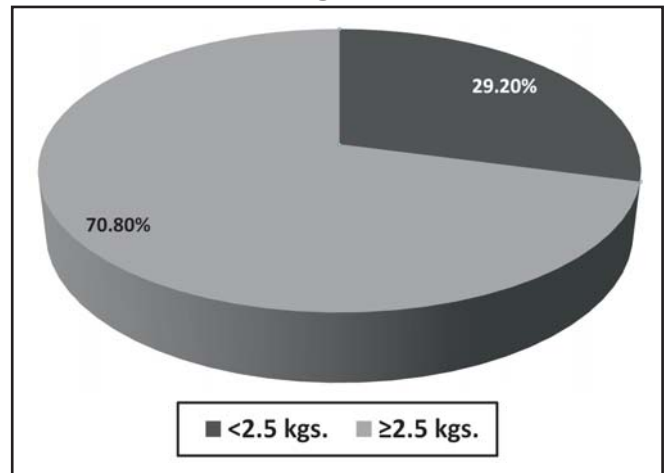
significantly higher in mothers who were illiterate, doing labour work and belonging to lower socio-economic class.(Table 2)

Discussion:

In present study prevalence of low birth weight was 29.2% and this finding on prevalence of low birth weight was supported by study of Bhue PK et al[11] which was 27.7% and also in the study by Paliwal A et al[12] but in a study by Zaveri A et al[13] used a sub-sample of the NFHS-4 data where about 17.5% of children are found to be born with LBW. The prevalence rate of LBW is higher and also the mean birth weight of new born is lesser in most of the hospital-based studies. The reason may be most of the high-risk pregnancies deliver in tertiary health care centres.[14]

Majority of newborns' mothers belong to age group 21 to 30 years which was similar to study conducted by Bhue PK et al[11] and Metgud CS et al.[14] In this study 15.4% newborns' mothers were Illiterate and this result was similar (15.5 %) in the study conducted by Borah M et al[15] and Shanti Ramesh S et al[16] which was 15.5% and 12% respectively while in study by Zaveri A et al[13] it was 20%. In current study majority (77.8%) newborns were belonged from mothers who were housewife which was followed by 16.8% from labour and 5.4% from service doing in private/govt. sector. A study by

Table 1: Distribution of newborns according to Socio-Demographic characteristics (N=500)

Variables	Category	Frequency (%)
Mother's Age (In completed years)	≤20	49 (9.8)
	21-25	271 (54.2)
	26-30	129 (25.8)
	31-35	26 (5.2)
	>35	25 (5)
Father's Age (In completed years)	≤20	0 (0)
	21-25	256 (51.2)
	26-30	184 (36.8)
	31-35	31 (6.2)
	>35	29 (5.8)
Mother's Education	Illiterate	77 (15.4)
	Primary	272 (54.4)
	Secondary	81 (16.2)
	higher secondary	48 (9.6)
	Graduate& above	22 (4.4)
Father's Education	Illiterate	65 (13)
	Primary	222 (44.4)
	Secondary	111 (22.2)
	higher secondary	71 (14.2)
	Graduate& above	31 (6.2)
Mother's Occupation	Housewife	389 (77.8)
	Labour	84 (16.8)
	Service (private/Govt.)	27 (5.4)
Father's Occupation	Agriculture	41 (8.2)
	Labour	314 (62.8)
	Business	57 (11.4)
	Service (private/Govt.)	73 (14.6)
	Unemployed	15 (3)
Residential area	Urban	293 (58.6)
	Rural	207 (41.4)
Religion	Hindu	382 (76.4)
	Muslim	118 (23.6)
Type of family	Nuclear	69 (13.8)
	Joint	187 (37.4)
	Three Generation	244 (48.8)
Socio economic class*	Upper class (I)	35 (7)
	Upper middle class (II)	56 (11.2)
	Middle class (III)	164 (32.8)
	Lower middle class (IV)	194 (38.8)
	Lower class (V)	51 (10.2)

*According to modified BG prasad classification

Pal A et al[17] shows similar kind of distribution of mothers in category of occupation in which majority 85.33 % of mothers were housewife, 10.03% were labourer while 4.6% were doing service. Supportive results also seen in the study of Bhue PK et al[11] More than three fifth (62.8%) of newborns belonged to father who were doing labour work similar result in a study by Pal A et al[17] where more than three fifth (65.95%) of fathers were labourer. Majority (76.4%) of mothers were Hindu and this result was supported by the study conducted by Metgud CS et al[14] and Bhue PK et al[11] in which it was 85.8% and 96.02% respectively. Nearly half (48.8%) of newborns were from three generation family while in study by Bhue PK et al[11] half (51.26%) mothers belong to joint family while only 7.57% from three generation family and this is contrast to the present study finding. Socio economic class distribution of study participants in present study supported by Pal A et al[17] and Bhue PK et al[11] in which majority of mothers belong to lower/upper lower class which was followed by middle/upper middle class and upper class.

In this study, mothers with pregnancy presented after 35 years and less than equal to 20 years had greater chance of having low birth weight newborns as compared to mothers belonging to other age group categories. In study by Bhue PK et al[11] the proportion of LBW babies was higher in below 20 years mothers (44.19%) and $\geqslant$ 30 years (39.56%) as compared to 20-29 years (25.0%) and the association between maternal age and LBW was found significant (p<0.05). In the study by Metgud CS et al[14] percentage of LBW babies was 50.0% (n = 9) in the $\geqslant$ 35 years age group, followed by 33.3% (n = 20) in 30–34 years age group. The least percentage (19.9%) of LBW was noted in the age group of 20–24 years (n = 130). As the maternal age increased the chances of having LBW baby also increased (crude OR 4.0, 95% CI 1.6–10.3, p 0.004). This result also supported in study by Jayaraj N et al[9] In prior age group it might be due to primiparous mothers have not experienced childbirth and might have less knowledge about pregnancy care. Lower maternal age of primiparous mothers might also be another reason which was also evident from the stratified analysis based on the age group. It may be due to the fact that teenage mothers are both physically and mentally less capable for bearing the burden of pregnancy. While in later age group it may due to multiparity and less interpregnancy interval which may lead to nutrition depletion of mothers.

In present study, prevalence of low birth weight was significantly higher in mothers who were illiterate. In a study by Bhue PK et al[11] the proportion of LBW was high in mothers who were illiterate (53.52%). The LBW proportion decreased as educational standard increased. The association between mothers' education and birth weight of babies was found statistically significant (p<0.05).In a study by Zaveri A et al,[13] the prevalence of LBW was 6.3% lower among higher educated women as compared to women who had no formal education (13.3% vs. 19.6%). (p<0.001) Education plays an important role in improving health-seeking behaviour, social status, and living standard and health awareness such as maternal health service utilization, proper maternal feeding practices, etc.[18] Therefore, interventions to improve the education level of women and female children are important to reduce prevalence LBW in India.[19]

Maximum 42.9% prevalence of low birth weight was seen in labourer mothers which was followed by 27% in housewife and 18.5% in service (private/govt.) doing mothers and this was supported by Bhue PK et al[11] the proportion of LBW was higher in manual labourer (67.14 %) than housewives (25.10%) and service class mothers (12.50%) and the association was found statistically significant (p<0.05). Similar finding also reported in the studies of Deshpande JD et al[20] and Bener A et al[21]

The area of residence was not associated with the LBW and it is supported by Taywade ML et al[22] Religion of newborn also not shown any association

Figure 2: Association between Mothers' Age and Birth Weight of Newborns (N=500)
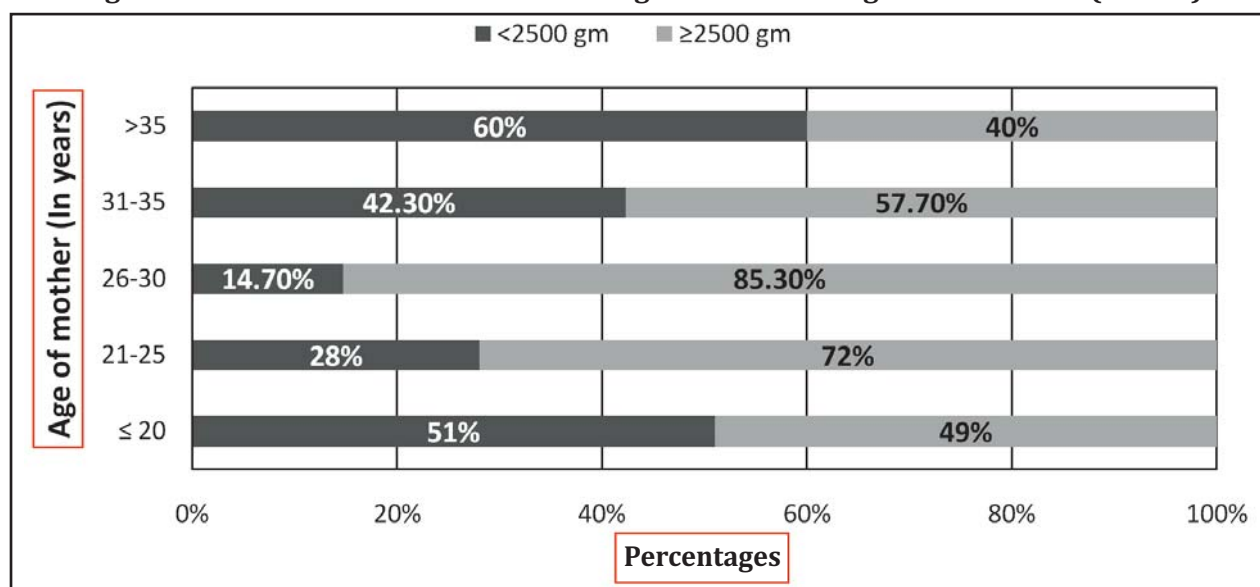
Table 2: Association between Socio-Demographic Characteristics of Newborn Mothers' and Newborns' Birth Weight (N=500)

Variables	Category	Birth weight (in grams)				Total		Chi-Square Value	p-Value
		<2500		≥2500					
		n	%	n	%	n	%		
Mothers' Education status	Illiterate	31	40.3	46	59.7	77	15.4	12.90	0.012*
	Primary	83	30.5	189	69.5	272	54.4		
	Secondary	22	27.2	59	72.8	81	16.2		
	Higher secondary	8	16.7	40	83.3	48	9.6		
	Graduate& above	2	9.1	20	90.9	22	4.4		
Mothers' Occupation	Housewife	105	27	284	73	389	77.8	9.99	0.007*
	Labour	36	42.9	48	57.1	84	16.8		
	Service (private/Govt.)	5	18.5	22	81.5	27	5.4		
Residential area	Urban	78	26.6	215	73.4	293	58.6	2.28	0.13
	Rural	68	32.9	139	67.1	207	41.4		
Religion	Hindu	113	29.6	269	70.4	382	76.4	0.11	0.74
	Muslim	33	28	85	72	118	23.6		
Type of family	Nuclear	19	27.5	50	72.5	69	13.8	3.11	0.21
	Joint	47	25.1	140	74.9	187	37.4		
	Three Generation	80	32.8	164	67.2	244	48.8		
Socio economic class	Higher	5	14.29	30	85.71	35	7	33.82	0.0001*
	Middle	40	18.18	180	81.82	220	44		
	Lower	101	41.22	144	58.78	245	49		

*Statistically Significant

with birth weight and this finding supported by Pal A et al,[17] Bhue PK et al,[11] Yadav DK et al[23] Type of family shown no association with birth weight while in contrast study of Bhue PK et al[11] shows Prevalence of low birth weight was significantly high among the nuclear family. (p<0.05)

In this study prevalence of low birth weight was significantly higher (41.22%) in lower socioeconomic group, similarly a study by Pal A et al[17] has shown that the prevalence of low birth weight in lower/upper lower class was 23.69%, in middle/upper middle class was 21.7% and in upper class was 14.65%. This study showed that women from lower socioeconomic families were more prone to deliver LBW babies. (p<0.001)Similar result also seen in study by Bhue PK et al,[11] Jayaraj N et al [9] and Ramesh S et al.[16] Such an association may be related to several potential mechanisms. A poor maternal nutritional intake during pregnancy, which is more likely among low socioeconomic groups and also certain socio cultural practices among them, may contribute to LBW.[15] So, all above result along with comparisons support that prevalence of low birth weight higher as socioeconomic class moves towards lower.

Limitations:

It is a hospital-based study so the results cannot be generalized. The study did not include obstetric factors, nutrition status of mother, infections and other complications during pregnancy which could have effect on occurrence of LBW.

Conclusion and Recommendation:

Prevalence of LBW newborns was 29.2% in the study population. Socio-demographic variables like mothers age >35 years and ≤ 20 years, illiteracy, labour work and lower socioeconomic status were significantly associated for delivering low birth weight newborns.

Education plays an important role in improving health-seeking behaviour, social status, and living standard and health awareness such as maternal

health service utilization, proper maternal feeding practices, etc. So, the study findings recommend that female literacy status should be improved by enhancing school enrolment and decreasing school dropout rate. Future research is needed to identify the factors responsible for LBW newborns among labourer women. Women should be educated to avoid pregnancy at extremes of the reproductive age. Special attention should be given to women of lower socioeconomic class to decrease LBW newborns among them.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References:

1. Monitoring the situation of children and women. UNICEF Data.May 2019https://data.unicef.org/topic/nutrition/low-birthweight.[Last accessed on 2021 Feb 23].

2. Sengupta P, Sharma N, Benjamin AI. Risk Factors for Low Birth Weight: a case-control study in Ludhiana, Punjab. Indian Journal of Maternal and Child Health. 2009 Jan; 11:1-4.

3. Hughes MM, Black RE, Katz J. 2500-g low birth weight cutoff: history and implications for future research and policy. Matern Child Health J. 2017Feb; 21(2): 283-289.

4. Ghosh S, Bhargava SK, Saxena HM and Sagreiya K. Perinatal mortality: report of a hospital-based study. Annals of Tropical Paediatrics 1983;3(3):115-119.

5. Health and Family Welfare Statistics in India 2019-20.pdf www.main.mohfw.gov.in/ www.nrhm-mis.nic.in[Last accessed on 2021 May 10].

6. National Family Health Survey 4; available at; http://www.rchiips.org/nfhs. [Last accessed on 2021 May 10].

7. Mallick A. Prevalence of low birth weight in India and its determinants: Insights from the National Family Health Survey (NFHS), 2015–2016.J. Biol. Clin.Anthropol. 2021 Jan;78(3): 163–175.

8. Child Trends Data Bank. Low and very low Birth weight Infants: Indicators of child and youth well-being.2012; available at; http://www.childtrendsdatabank.org.[Last accessed on 2021 Jun 5].

9. Jayaraj N, Rathi A, Taneja D. Determinants of low birth weight babies born in a secondary and tertiary level government hospital in Delhi: a matched case control study. Int J Community Med Public Health. 2020 Jul;7(7):2506-2512.

10. All India Consumer Price Index. Labour bureau of India, http://labourbureau.nic.in/indtab.pdf. [Last accessed on 2021 Jul 15].

11. Bhue PK, Acharya HP, Pradhan SK, Biswal P, Swain AP, Satapathy DM. Socio-demographic factors associated with low birth weight in a tertiary care hospital of Odisha. Int J Community Med Public Health. 2018 May;5(5):1797-1802.

12. Paliwal A, Singh V, Mohan I, Choudhary RC, Sharma BN. Risk factors associated with low birth weight in newborns: a tertiary care hospital based study. Int J Cur Res Rev. 2013;5(11):42-8. 8.

13. Zaveri A, Paul P, Saha J, Barman B, Chouhan P (2021) Correction: Maternal determinants of low birth weight among Indian children: Evidence from the National Family Health Survey-4, 2015-16. PLOS ONE.Dec 2020;16(4): e0250140.

14. Metgud CS, Naik VA, Mallapur MD (2012) Factors Affecting Birth Weight of a Newborn – A Community Based Study in Rural Karnataka, India. PLoS ONE 7(7): e40040.

15. Borah M, Agarwalla R. Maternal and socio-demographic determinants of low birth weight (LBW): A community-based study in a rural block of Assam. J Postgrad Med. 2016 Jul-Sep;62(3):178-81.

16. RameshS, SundariS, Harsha M. Association between maternal undernutrition and low birth weight: A hospital-based study in Chennai. Indian Journal of Child Health. 2019 Aug; 6(8): 439-442.

17. Pal A, Manna S, Das B, Dhara PC. The risk of low birth weight and associated factors in West Bengal, India: a community based cross-sectional study. Egyptian Pediatric Association Gazette. 2020 Dec; 68(1):1-11.

18. Agarwal G, Ahmad S, Goel K, Kumar V, Goel P, Garg M, Punj A. Maternal risk factors associated with low birth weight neonates in a tertiary care hospital, Northern India. J Community Med Health Educ. 2012;2(9):1000177.

19. Kader M, Perera NK. Socio-economic and nutritional determinants of low birth weight in India. N Am J Med Sci. 2014 Jul;6(7):302-8.

20. Deshpande JD, Phalke D, Bangal VB, Peeyuusha D, Bhatt S. Maternal Risk Factors for Low-Birth-Weight Neonates: A Hospital Based Case-Control Study in Rural Area of Western Maharashtra, India. Natl J Community Med. 2011 Dec;2(03):394-8.

21. Bener A, Salameh KM, Yousafzai MT, Saleh NM. Pattern of Maternal Complications and Low Birth Weight: Associated Risk Factors among Highly Endogamous Women. ISRN Obstet Gynecol. 2012;2012:540495.

22. Taywade ML, Pisudde PM. To study the sociodemographic determinants of LBW babies in Wardha district, India.ClinicalEpidemioligy and Global Health.2017 May;5(1):14-20.

23. Yadav DK, Chaudhary U, Shrestha N. Risk factors associated with low birth weight. J Nepal Health Res Counc. 2011 Oct;9(2):159-64.

A Cross-Sectional Study on Determinants of Career Choice Preferences among Undergraduate Medical Students at One of the Medical Colleges of Gujarat, India

Chikitsa Amin[1], Dharti Kansagra[2], Vilpa Tanna[1]

[1]Assistant Professor, [2]Junior Resident, Community Medicine Department, P. D. U. Government Medical College, Rajkot, Gujarat

Correspondence : Dr. Kansagra Dharti J. E-mail: kansagradhartijk@gmail.com

Abstract:

Introduction : Choosing a medical specialty is a life-defining decision for medical students. As medical students progress through medical course, it is observed that their interests in specialties change due to one reason or another. **Objectives:** 1.To assess career choices for post-graduation among under graduate medical students. 2. To determine the factors influencing the carrier choices of study participants. **Method:** A cross sectional study was conducted among 594 MBBS students of one of the Government Medical Colleges of Gujarat during December 2019 to March 2020. All undergraduate medical students except student from 1st year MBBS was enrolled in the study by purposive sampling. A self-administered pretested, semi-structured questionnaire was utilized to collect socio-demographic variables, their choice of post-graduation subject and reasons for the same. Descriptive statistics such as mean, standard deviation (mean ± SD) and percentage were calculated. Chi square test was applied for statistical analysis. **Results:** Out of 594 participants studied, 375 (63.1%) were males and 219 (36.9%) females. Most preferred specialties were medicine 138(24.7%) and general surgery 60(10.7%)among all students. Obstetrics and Gynaecology 34(75.6%) and Community Medicine 2(59.0%) were preferred by females while General Surgery 51 (85.0%) and Orthopaedics 20 (87.0%) were more preferred by males as a career. This difference proved to be statistically significant(p < 0.05). The distribution by years with different specialties shows statistically significant differences with Medicine, Dermatology, Paediatrics, ENT, Ophthalmology and Others. Personal interest was most valued influencing factor among 184 (31.0%) followed by job opportunities 111 (18.7%) and the least popular factor was financial reasons 17 (2.9%). **Conclusion:** The majority of the students planned to specialize in clinical fields such as Medicine and Surgery. Most common factors influenced their choices were personal interests and career opportunities in the preferred fields. Financial reasons or the influence of the role model were least important factor as far as carrier choice of medical undergraduates was concerned.

Key Words : Career choice, Medical students, Post graduation.

Introduction:

Choosing a medical speciality as a career is a life defining decision for medical students. A speciality selection entails a transformation from the undifferentiated undergraduate stage to a fully differentiated professional enterprise in which all future efforts are focused on a single specialized medical specialty.[1] Choosing a medical speciality can be a very confusing decision for medical students with an increasing number of specialities and subspecialties available today. For most of them, it is a transition period, meaning what they considered as

a career choice at time of entrance may change completely by the time they graduate. [2]

Diverse factors influence medical students' career choice. Career preference is thought to play an important role at the time of admission to medical course.[3,4] Other factors that have been suggested to play an important role are medical college characteristics, lifestyle preferences, prestige, job opportunities, expected income, longitudinal care, pre-clinical and clinical experiences, and role models.[4-6]

Careful career choice by undergraduate medical students becomes critical as students may drop out of their chosen speciality or drop out due to incompatible aptitude or other reasons. Students may be urged to change their choice of speciality after spending few years in training. Such mishaps, mainly due to careless career choices, jeopardize efforts and undermine the entire process of intended delivery of adequate health-care services to the community.[7] Adequate and efficient health workforce are required to achieve accessible and equitable health care.[8,9] Therefore, it is important to strike a balance between meeting the needs of medical graduates and projections for health care workforce which align education, labour market and policies. The objective of this study was to identify the preferred career choices among medical students and the factors that influence their choices.

Method:

Across-sectional study was conducted among 594 medical students from Government Medical College, Gujarat from December 2019 to March 2020. Total of 700 undergraduate medical students, 200 from Second MBBS Part I (3rd and 4th Semester), 200 from Second MBBS Part II (5th Semester), 150 from Third MBBS Part I (6th and 7th Semesters)and 150 from Third MBBS Part II (8th and 9th Semesters) were contacted to study. All students who were willing to participate in the study were included by purposive sampling, so that ultimately 594 medical students were enrolled in the study. First year students were

excluded from the study, since they did not get to know all the subject areas as per seen in piloting. Students who were absent at the time of data collection were not included in the study.

After a comprehensive review of the literature authors developed a self-administered pre-tested, semi-structured questionnaire that includes demographic characteristics of the participants such as age, gender, current year of study and total income of family and occupation of father. The second section consists of the current preferred speciality choice, factors influencing the chosen speciality, and whether or not their parents were currently in medical practice. The purpose of collection of data was explained to the respondents after a brief introduction. The eligible respondents were interviewed after obtaining written informed consent. Data were entered into Microsoft Excel 2019 and analysed by using Epi-Info software (version 7.2.2.6). Descriptive statistics such as mean, standard deviation (mean±SD) and percentage were calculated. Chi square test for statistical analysis to find out the association between variables, p value < 0.05 was considered as statistically significant. Ethical committee approval was obtained from the Institutional Ethical Committee before conducting the study.

Results:

A total of 700 students were available for study in all semesters; 656 of them were present at the time of the interview. Thirty-four questionnaires were returned unfilled and 28 were incomplete. After exclusion of incomplete questionnaires total 594 questionnaires were analysed in the study.

Out of 594 students, 187 were Second MBBS Part I (3rd and 4th Semester), 164 were Second MBBS Part II (5th Semester), 125 were Third MBBS Part I (6th and 7th Semesters), 118 were Third MBBS Part II (8th and 9th Semesters) students. The gender distribution showed that 375 (63.1%) of the students were males and 219 (36.9%) females. The age group of study participants ranged from 18 to 25 years with a Mean

±SD of 19.7±1.52. Majority of participants 555 (93.4%) reported that both of their parents were not in the medical field, while only 39 (6.6%) had a one parent currently in medical practice. The demographics and other characteristics of the respondents are shown in Table 1.

Out of the 594 medical students, 559 students intended to pursue post graduation in various specialities, while 35 students did not plan to pursue a specialization. (Table 1)

When the reasons for not pursuing a postgraduate career were surveyed, 12 (34.3%) of them stated that there was no specific reason, 7 (20.0%) wanted to enter the public service, 6 (17.1%) stated that they would being satisfied with their graduation, 4 (11.4%) found it difficult to qualify for a postgraduate seat, 3(8.6%) indicated that their career settlement might be delayed due to postgraduation, 3 (8.6%) were confused about their career.

The top three preferred specialities were Medicine138 (24.7%), then Surgery 60 (10.7%) and Radiology 50 (8.9 %). The distribution by years with different specialties shows statistically significant differences with Medicine, Dermatology, Paediatrics, ENT, Ophthalmology and Others. (Table 2) Medicine subject was preferred by 138 medical students, out of whom 88 (63.8%) were males and 50 (36.2%)were females. Obstetrics and gynaecology 34 (75.6%) and Community Medicine 23 (59.0%) were more preferred among females than in males, while General Surgery 51 (85.0%) and Orthopaedics 20 (87.0%)were more strongly preferred among males as a career. This difference proved to be statistically significant (p <0.05). (Table 3)

The most common factor in choosing speciality was personal interest 184 (31.0%) followed by job opportunities 111 (18.7%) and private practice 89 (15.0%), and the least common factor was the financial reasons 17 (2.9%). Except for Obstetrics and Gynaecology all the surgical and allied branches

Table 1: Socio-demographic characteristics of study participants (N = 594)

Variables		n (%)
Gender	Male	375 (63.1)
	Female	219 (37.0)
Residence	Urban	498 (83.8)
	Rural	96 (16.2)
Current year of study	Second MBBS Part I (3rd and 4th Semester)	187 (31.5)
	Second MBBS Part II (5th Semester)	164 (27.6)
	Third MBBS Part I (6th and 7th Semesters)	125 (21.0)
	Third MBBS Part II (8th and 9th Semesters)	118 (19.9)
Total family income per month (INR)	<20000	76 (12.8)
	20000 – 50000	317 (53.4)
	50001 – 100000	149 (25.1)
	100001 - 300000	52 (8.8)
Occupation of Father	Govt. job	201 (33.8)
	Private Job	161 (27.1)
	Business	128 (21.5)
	Agricultural	73 (12.3)
	Doctor	16 (2.7)
	Labourer	9 (1.5)
	Unemployed / Retired	5 (0.8)
	Died	1 (0.2)
Wanted to pursue post graduation	Yes	559 (94.10)
	No	35 (5.90)

were significantly more preferred by males as compared to females. The gender specific distribution of the influencing factors did not have statistically significant association with p value < 0.01. (Figure 1)

Discussion:

Medical students from all years of medical course were included in the current study. While second year students had no exposure to clinical subjects, third first year students had a preliminary exposure and third final year students were studying

Table 2: Preferred Speciality for post graduation among students according to their Current phase of study (N=559)*

Speciality	No. of students (%)					p value ***
	Second MBBS part I (3rd and 4th Semester) (n = 165)	Second MBBS Part II (5th semester) (n = 163)	Third MBBS Part I (6th and 7th Semesters) (n = 116)	Third MBBS Part II (8th and 9th Semesters) (n = 115)	Total (N= 559)	
Medicine	49 (29.7)	28 (17.2)	40 (34.5)	21 (18.3)	138 (24.7)	**0.001**
Surgery	22 (13.3)	18 (11.0)	10 (8.6)	10 (8.7)	60 (10.7)	0.528
Radiology	19 (11.5)	17 (10.4)	10 (8.6)	4 (3.5)	50 (8.9)	0.180
Obstetrics and Gynaecology	5 (3.1)	19 (11.7)	10 (8.6)	11 (9.6)	45 (8.1)	0.057
Dermatology	0 (0.0)	18 (11.0)	6 (5.2)	18 (15.7)	42 (7.5)	**0.001**
Paediatrics	1 (0.6)	11 (6.7)	6 (5.2)	22 (19.1)	40 (7.2)	**0.001**
Community Medicine	7 (4.2)	15 (9.2)	6 (5.2)	11 (9.6)	39 (7.0)	0.128
ENT, Ophthalmology	19 (11.5)	7 (4.3)	4 (3.4)	2 (1.7)	32 (5.7)	**0.005**
Anaesthesia	6 (3.7)	12 (7.4)	9 (7.8)	4 (3.5)	31 (5.5)	0.422
Orthopaedics	0 (0.0)	8 (4.9)	6 (5.2)	8 (7.0)	22 (3.9)	**0.042**
Psychiatry	0 (0.0)	1 (0.6)	2 (1.7)	2 (1.7)	5 (0.9)	0.782
Others**	37 (22.4)	9 (5.5)	7 (6.0)	2 (1.7)	55 (9.8)	**0.001**

* 35students did not want to pursue postgraduate studies
**Anatomy, Physiology, Pathology, Microbiology, Forensic medicine, Pharmacology
***Chi-square test was applied

clinical subjects, after completing the pre- and paraclinical subjects. A study done at a private medical college in southern India has shown that almost all students (99.2%) wish to pursue postgraduate studies, more than the 83.5% in the study done at a government medical college in Delhi.[10] Similar findings are also reported from current study as the institute is also a government medical college. This difference could occur because the study was conducted in a different study setting (government versus private).

A small proportion of the students were not planning to pursue a postgraduate course. Several students did not give a reason for the same, but some students wanted to go into public service. A trained medical person may be an asset in the public health service. Some of the other reasons relate to dissatisfaction with the system of postgraduate includes hard to qualify for post graduation seat and career settlement is delayed in medical education in India.

The top two preferred speciality choices in current study were Medicine and then Surgery. Traditionally students have preferred these two topics, as shown in other studies within India, other developing and developed countries.[11-13] The current study observed that these specialities subjects have been popular amongst students as they are often most discussed by academic staff in medical college. It could also be because they are specialities that are

Table 3: Gender wise distribution of preferred choice of specialities among participants (N=559)*

Speciality	Males (N = 352)	Females (N = 207)	Total (N=559)	p value***
Medicine	88 (25.0)	50 (24.2)	138 (24.7)	0.8231
Surgery	51 (14.5)	9 (4.3)	60 (10.7)	**0.0002**
Radiology	36 (10.2)	14 (6.8)	50 (8.9)	0.1659
Obstetrics and gynaecology	11 (3.1)	34 (16.4)	45 (8.1)	**0.0000**
Dermatology	22 (6.3)	20 (9.7)	42 (7.5)	0.1395
Paediatrics	28 (8.0)	12 (5.8)	40 (7.2)	0.3393
Community Medicine	16 (4.5)	23 (11.1)	39 (7.0)	**0.0033**
ENT, Ophthalmology	21 (6.0)	11 (5.3)	32 (5.7)	0.7483
Anaesthesia	20 (5.7)	11 (5.3)	31 (5.5)	0.8537
Orthopaedics	20 (5.7)	3 (1.4)	23 (4.1)	**0.0150**
Psychiatry	3 (0.9)	1 (0.5)	4 (0.7)	1.0000
Others**	36 (10.2)	19 (9.2)	55 (9.8)	0.6873

* 35 students did not want to pursue postgraduate studies
**Anatomy, Physiology, Pathology, Microbiology, Forensic medicine, Pharmacology
***Chi-square test

Figure 1: Gender wise distribution in percentage of factors influencing the career choice decisions of study participants (N=352 for males and N= 207 for females)
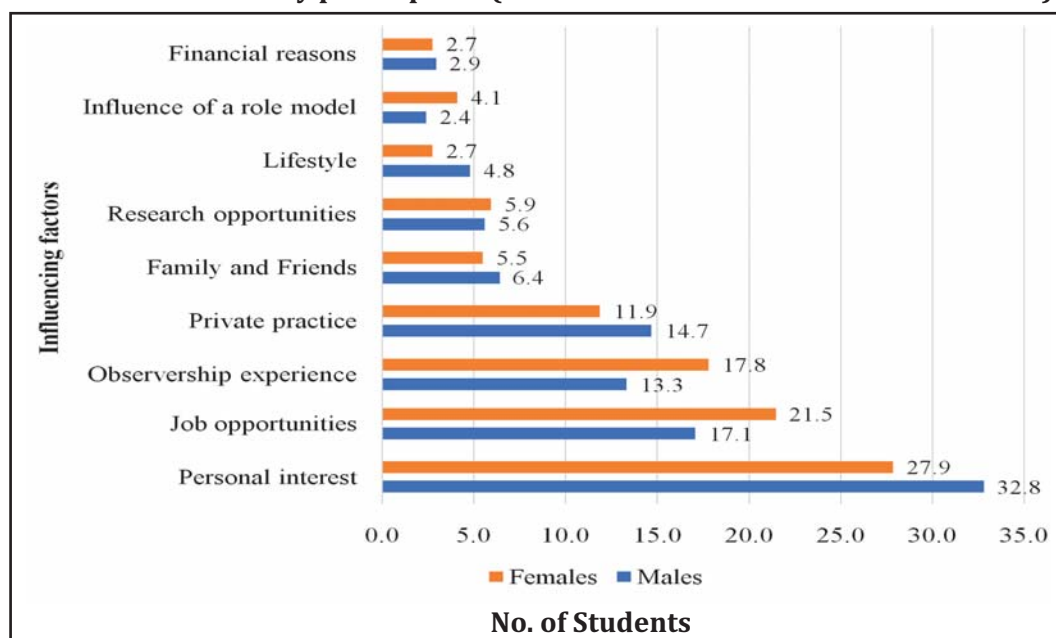
generally considered as major branches of the medical field. Another possible explanation is that students are not exposed to a wide variety of specialties in their early years of studying; they focus on basic subjects and have not yet gained any clinical experience. Therefore, their choice was based on the major specialties that they tended to hear about or come across. Radiology, Dermatology, Obstetrics and Gynaecology, Paediatrics and Community Medicine were choices for some, with the remaining subjects

having very few prospects. Only a handful of our students considered a career in non-clinical subjects. In fact, around 9% of the students chose Anatomy, Biochemistry, Physiology, Forensic Medicine and Pathology. Psychiatry is the least preferred subject in this study.

Medicine was equally favoured in all years of students. However, the inclination to study Surgery and Radiology decreased as students became more senior. A similar finding was found in another study in India.[14] Students from the third year of study were more likely to be influenced by experience during clinical posting in the various speciality of course compared to the students of second semester. Career preferences change dynamically as students' progress through the course and explore different specialities. we presume that students had certain choices of students at time of entrance might completely change. While study has not followed up on students' choices, it might be presumable that certain choices of students at time of entrance might completely change by the present one. It is just as likely that their choices will change in subsequent years.[11] Otorhinolaryngology, Ophthalmology, Anaesthesia and Psychiatry only had few takers. This could be due to junior students not being exposed to this speciality until they reach their senior years. Therefore, they have no idea what it is like or what it entails. Further study to identify the reasons why students do not take up these subjects would be helpful. Once these reasons have been identified, it may be possible to design interventions to influence career choices. However, changing career preferences in one speciality can have undesirable effects on choices in another specialties.[15]

Gender specific differences were shown in the preference of certain specialities in this study. Medicine was favoured equally in both the gender. Majority of the students 34 (75%) who choose Obstetrics and Gynaecology and 23 (60%) of the students who choose Community Medicine as their preferred speciality were females. This could also be because Community Medicine is often viewed as a more family-oriented speciality that allows for a more controllable and manageable lifestyle. This remains an important factor for female medical students deciding on a speciality. Similarly, over 85% of the students who choose Surgery and over 87% of the students who choose Orthopaedics as their preferred speciality were males. This finding is consistent with other study results.[16] The most popular influencing factor chosen throughout the study was personal interest. Other factors rated important by respondents included job opportunities, observer ship experience, private practice, lifestyle, family and friends, career stability and income. These factors were not very different from those reported by students in other Asian and Western countries.[11,15]

Limitation:

The study identified "preferred" choice rather than the student's actual choice, making it difficult to determine if this is student's realistic career choice.

Conclusion:

Present study revealed that the students' most preferred specialties were Internal Medicine, Surgery and Radiology with gender differences; males preferred Surgical specialties such as Surgery and Orthopaedics and females preferred Obstetrics and Gynaecology and Community Medicine. Pre and paraclinical subjects were not in the foreground in the selection list. The most influencing factor for carrier choice was personal interest of the students. Other factors rated important by respondents were job opportunities, observer ship experience, private practice, lifestyle, suggestion of family and friends, career stability and income. A follow up study would be useful to identify further trends in career choices. Inhibiting factors can be utilized by mentors and the medical workforce to encourage students to choose specialties that are underrepresented and thus better serve the immediate community.

Acknowledgement:

References:

1. Parlak A, Develı S, Yusuf Eyı E. Medical Teacher Factors affecting the choice of health speciality by medical graduates. Med teacher. 2015;37(7):702-703.

2. Aisha N, Ameen N, Jassim G. Career Choices Among Medical Students and Factors Influencing Their Choices. Global journal of health science. 2019;11(4):132–7.

3. Wright B, Scott I, Woloschuk W,Brenneis F, Bradley J. Career choice of new medical students at three Canadian universities: family medicine versus speciality medicine. CMAJ 2004;170(13):1920–4.

4. Wright B, Scott I, Powis D, Woloschuk W, Henry R, Turnbull D, et al. Career preferences of new medical students at four Australian universities: rural family medicine versus the rest. Aust J Rural Health. 2006;14(5):229–30.

5. Raja A, Jahanvi G,Patra S. Career choices of the first year students of Madha Medical College International Journal of Community Medicine and Public Health .2017;4(4):1094

6. Avan BI, Raza SA, Hamza H, Khokhar S, Awan F. Factors Influencing the Selection of Surgical Specialty among Pakistani Medical Graduates. Journal of Postgraduate Medicin.2003; 49(3):197-201

7. Zhang L, Bossert T, Mahal A, Guoqing H , Guo Q , Liu Y. Attitudes towards primary care career in community health centers among medical students in China. BMC Family Practice.2016; 17:75

8. Guraya SY, Almaramhy HH. Mapping the factors that influence the career speciality preferences by the undergraduate medical students. Saudi J Bio Sci. 2018;25:1096–101.

9. World Health Organization. The World Health Report 2008: Primary Health Care – Now More than Ever. Geneva: Available from: http://www.who.int/whr/2008/08_overview_en.pdf. [Cited 2022 Nov 29]

10. Lal P, Malhotra C, Nath A,Malhotra R, Ingle GK. Career aspirations and apprehensions regarding medical education among first year medical students in Delhi. Indian J of Community Medicine. 2007;32(3):217-18.

11. Huda N, Yousuf S. Career preference of final year medical students of Ziauddin Medical University. Educ Health (Abingdon). 2006;19(3):345–53.

12. Mariolis A, Mihas C, Alevizos A, Gizlis V, Mariolis T, Marayiannis K, et al. General Practice as a career choice among undergraduate medical students in Greece. BMC Med Educ. 2007;7:15.

13. Kar SS, Ramalingam A, Premarajan KC, Roy G. Do Medical Students Prefer a Career in Community Medicine? Int J Prev Med. 2014;5(11):1468-74.

14. Kumar R, Dhaliwal U. Career choices of undergraduate medical students. Natl Med J India. 2011;24(3):166–9.

15. Khader Y, Al-Zoubi D, Amarin Z, Alkafagei A, Khasawneh M, Burgan S, et al. Factors affecting medical students in formulating their speciality preferences in Jordan. BMC Med Educ. 2008;8:32.

16. Hin Hin Ko, Tim K, Yvette L, Fleming B, Vikis E, Yoshida E. Factors influencing career choices made by medical students, residents, and practising physicians. British Columbia Medical Journal. 2007;49(9):482-489.

Management of Severe Acute Malnutrition in Day Care Settings : Findings from Innovative Public Private Partnership at Devbhumi Dwarka District, Gujarat

Dharmik Gadhavi[1], H K Bhavsar[2], Darshana Rathod[3], Roshni Khepatwal[4], Vikas Desai[5], Somen Saha[6], Abid Qureshi[7], Apurva Ratnu[8]

[1]Medical Student, GMERS Medical College, Gandhinagar, [2]Associate Professor, Department of Medicine,

M K Shah Medical College and SMS Hospital, Ahmedabad, [3]Teaching Fellow, Imperial College, London, [4] Project Officer,

[5] Project Advisor, [8] Director, Niramay Charitable Trust, Gandhinagar, [6]Associate Professor, [7]Research Officer, IIPH, Gandhinagar

Correspondence : Dr. Apurva Ratnu, Email: niramaygujarat@gmail.com

Abstract:

Introduction : Severe Acute Malnutrition (SAM) is a major public health concern that is linked to a high mortality rate in children under the age of five. Government of Gujarat has expanded treatment network from government facilities to private institutions and non-governmental organizations through various initiative in an effort to address the issue of SAM. **Objective:** To assess the treatment outcome among SAM children (0-5 years) admitted at Niramay Bal Poshan Kendra, Jam Khambhalia, Devbhumi Dwarka District of Gujarat. **Method:** A longitudinal study was conducted among SAM children admitted at the Niramay Bal Poshan Kendra (Public Private Partnership model under Bal Poshan Yojana) which is a day care center providing treatment to SAM children for 14 days according to the protocol of NRC (Nutrition Rehabilitation Centre). Under Bal Poshan Yojana, RBSK medical officers screen children for SAM and refer them for treatment at empanelled NGO/Private institution. Total 1557 under five children were screened by them between 6th September 2021 and 5th February 2022. Out of them 121 SAM children were identified, 95 children could be mobilized at the study site (Niramay Bal Poshan Kendra). Out of 95 children, 76 SAM children completed the treatment along with all three follow up at the study site. The data of these 76 Children was analyzed. **Results:** Among 76 children, average weight gain was 566 grams at the time of discharge and 1000 grams at the time of third follow-up. An average weight gain for the cohort is 5.2 gram/kg/day. At the end of treatment, 92% children moved out of the SAM category at the completion of three follow-up, 55% moved to Moderate Acute Malnutrition and 37% to normal weight category. **Conclusion:** An average weight gain among the study population was satisfactory. Day care treatment model provides advantage of improved treatment completion rate and higher follow-up completion. Similar models of SAM treatment can help in effectively tackling menace of malnutrition in Gujarat.

Key Words : Child Day Care Centres, Child Malnutrition Treatment Centres, Public Private Partnership, Severe Acute Malnutrition.

Introduction:

Child malnutrition remains one of the life-threatening causes among under five children. A severely malnourished child has an 11-fold increased risk of dying from common childhood illnesses than a well-nourished child. Globally around one in five deaths among children under five are due to severe wasting.[1] According to the UNICEF / WHO / World Bank Group Joint Child Malnutrition Estimates, the global burden of child malnutrition remains an

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Gadhavi G, Bhavsar H, Rathod D, Khepatwal R, Desai V, Saha S, Qureshi A, Ratnu A. Management of Severe Acute Malnutrition in Day care settings: Findings from innovative Public Private Partnership in Devbhumi Dwarka District, Gujarat. Healthline. 2022; 13(4): 328-333.
	DOI : 10.51957/Healthline_466_2022	

alarming issue as there are 144 million (21.3%) children under five are stunted, 47 million (6.9%) are wasted and 38 million (5.6%) are overweight. It has also reported that India has 5,772,472 children under 5 years of age affected by severe wasting between 2017 and 2021, this proves that wasting is a critical public health emergency in India.[1]

As per National Family Health Survey 5, India has witnessed the marginal increase in severe wasting among 0-5 year children from 7.5% to 7.7% (NFHS 4). In the same time period, prevalence of stunting (38.4% to 35.5%) and underweight (35.8% to 32.1%) in children under 5 has been slightly declined.[2] There has been huge differences in SAM prevalence between different states. Maharashtra (10.9%), Gujarat (10.6%), Jammu & Kashmir (9.7%), Jharkhand (9.1%), Assam (9%) and Bihar (8.8) have highest SAM rates, higher than the national average (7.7%).[2] In Gujarat in particular, it has grown in comparison to NFHS 4 (9.5%).

In response to the burden of malnutrition, the Government of India has launched a flagship programme "POSHAN Abhiyaan" or "National Nutrition Mission" in 2018.[3] Currently children with severe acute malnutrition are admitted at facility based Nutritional Rehabilitation Centre (NRC) and managed with medical and therapeutic care. The community-based care has been linked with facility-based care; once discharged from the facility the SAM children are then enrolled into community-based program.

To mitigate the child malnutrition more effectively, Government of Gujarat (GoG) had implemented two approaches; Facility Based Management and Community Based Management of severely wasted children under the Mission Balam Sukham. Along with Government institutions, NGOs, universities, corporate social responsibility divisions of industries have come forward and taken up various initiatives to reduce the prevalence of SAM in India.

In Gujarat, NGO-run hospitals and private physicians have a long tradition of working with government agencies to provide maternal as well as paediatric healthcare and these public-private partnership models have been quite effective. The Chiranjeevi Yojana for improving institutional delivery and Bal Sakha Yojana for new born care are successful example for such partnership.[4,5]

Present study reveals the findings from the NGO providing facility-based nutrition care to the severely acute mal nourished children through an innovative approach. The NGO is funded by an industry (NAYARA Energy Ltd.), managed by academic institution (IIPHG), supported by district administration and implemented by NGO (Niramay Charitable Trust). Niramay Bal Poshan Kendra (Niramaya BPK) has been established as day care center under Bal Poshan Yojana (BPY) scheme since 6th September 2021 at Jam Khambhalia taluka of Devbhumi Dwarka District, Gujarat. The centre has dedicated 20 bedded wards, play area for the children, pantry and garden. Bal Poshan Yojana is an innovative public private partnership under Project Tushti to tap nongovernmental organization and private practitioners' expertise for treatment of SAM children with medical complication in Dwarka District.

Upon the admission at the centre, all the children were treated free of cost. The services include daily transport, daily consultation by a paediatrician and a medical officer, medicines (antibiotic, multivitamin supplements, anti-helminthics, and others deemed necessary by paediatrician), Therapeutic Nutrition (F-75, F-100 and EDNF - Energy Dense Nutritious Food), hot cooked meal for mothers and children, early childhood stimulus activities for children, child health and nutrition learnings for mother, compensation to the mother and transport back to home after the discharge. After the discharge from the centre, every child would be followed up for six weeks as per national treatment protocol.

A present study assesses the treatment outcome of SAM children who availed services at the Niramay Bal Poshan Kendra, Jam Khambhalia taluka of Devbhumi Dwarka District, Gujarat

Method:

Present study analyses result of the children admitted at the Niramay Bal Poshan Kendra (Niramay BPK) during the period of 5 months from 6th September 2021 to 5th February,2022.

All children were screened by screening team of Niramay BPK at anganwadis across Jam Khambhalia taluka of Devbhumi Dwarka District. All SAM children identified were admitted and intimated to concerned RBSK medical officers immediately. All children were duly verified for presence of SAM by RBSK Medical Officer and Project Tushti team within 24 hours. At the end of treatment for 14 days, weight and height at the time of discharge were again verified by RBSK medical officer, Project Tushti team and Taluka Health Officers. Admission and discharge criteria were as per WHO protocols mentioned in following sections.

According to WHO protocols, any child under five years of age who has been diagnosed as wasted is further classified as Severe Acute Malnourished child (SAM) and Moderate Acute Malnourished child (MAM). A child who has very low weight-for-height/length (Z- score < -3 SD of the median WHO child growth standards), or a mid-upper arm circumference is < 115 mm, or there is a presence of nutritional oedema is diagnosed as a severe acute mal nutrition (SAM) and a child who has 70-80% of median weight-for- height (Z score of >-3SD to <-2 SD), or a mid-upper arm circumference is 116-125 mm and no oedema is classified as a case of moderate acute malnutrition (MAM).[6]

As shown in figure 1, total 1557 children under 5 years of age were screened for anthropometric measurement for weight, height, MUAC and age (using Infantometer, Stadiometer, Weighing Scale and a Measuring Tap). Out of it, 121(7.8%) children

were diagnosed as SAM who were counselled for the treatment but 95 (79%) were turned up for the treatment and mobilized at the centre for the treatment. The majority; 85 of them (89%) have completed the treatment. Out of these 85 children, 76 have completed three follow-up till 15th April 2022. Current study recorded the socio-demographic profile these 76 children along with their Mean weight/MUAC gain. Their nutritional status was classified (SAM/SUW/MAM/MUW/Normal) on admission, at the time of discharge as well as during follow-up. Other variables such as successful mobilization rates, treatment completion rates and follow-up completion rates for the centre along with treatment outcome indicators also recorded.

Figure 1: Child Screening and Treatment Details (N=1557)
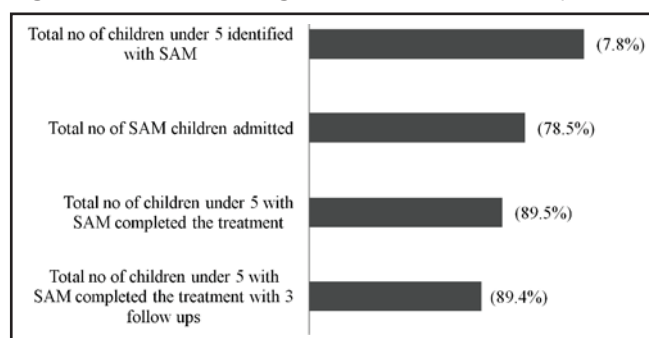
Results:

Total of 76 children completed 14 days day care treatment followed by six week follow-up. As per Table 1, 53% of SAM children were male. Only 4% children were below age of 6 months. Most of the children (51%) were between age six months to 24 months. Almost every child was born at facility (99%) and 26% were born by C-section. Most of the SAM child were born at term (84%) and most of them had early initiation of breastfeeding (68%),Exclusive breastfeeding for first six months (83%) and full immunization (80%). Low Birth Weight was documented in 41% of SAM children.

As per Table 2, significant increase in weight gain has been noted at the time of discharge and at the 3rd follow up. Mean weight gain from the period of admission to discharge and from the admission to

Table 1: Profile of SAM children who completed the treatment at study site (N=76)

Variables	n (%)
Gender	
Male	40 (53)
Female	36 (47)
Age in Months	
0-6	03 (4)
7-24	39 (51)
25-59	34 (45)
Place of Delivery	
Institutional	75 (99)
Home	01 (1)
Type of Delivery	
Normal	56 (74)
C-section	20 (26)
Early Initiation of Breast Feeding	
Yes	52 (68)
No	24 (32)
Exclusive Breast Feeding	
Yes	63 (83)
No	13 (17)
Duration of Pregnancy	
Term	64 (84)
Pre-Term	12 (16)
Birth Weight	
Normal	34 (45)
Low Birth Weight	31 (41)
No data available	11 (14)
Full Immunization (n=69, children age 9 months or above)	
Full Immunization	56 (81.1)
Partial Immunization	13 (18.9)

follow up was 566 grams and 1000 grams respectively. An average weight gain was 7.3% at the time of discharge and 13.09% by the end of follow up. Average MUAC also improved by 4 mm at the time of discharge and 10 mm by end of the treatment.

Figure 2 highlights weight gain in percentage compared to baseline weight. More than one third of children (37%) gained 15% or more while 25% children gained weight between 10-15%. Only 5% children showed poor weight gain between 0-4%.
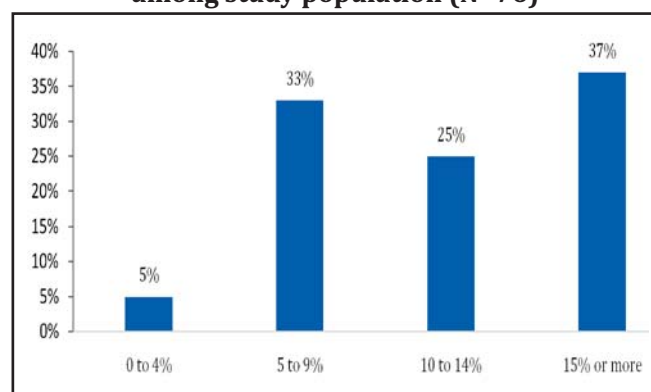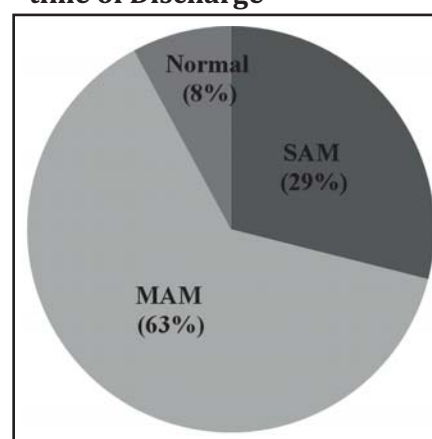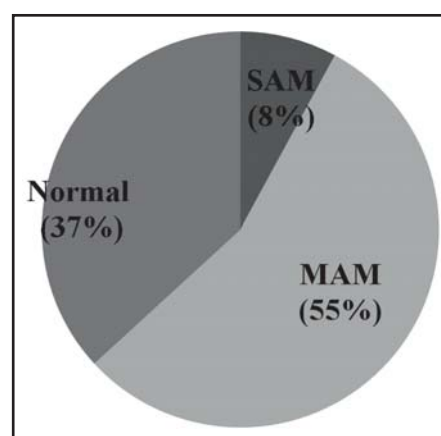
Figure 2: Percentage weight gain from the baseline among study population (N=76)

Figure 3: Nutritional status of participants at the time of Discharge

Figure 4: Nutritional status of participants at the time of follow-up

Table 2: Weight gain and MUAC of study participants (N=76)

Indicator	Admission	Discharge	Third Follow-up
Mean weight ± SD(Grams)	7839 ±1935	8405±2115	8839 ± 1983
Mean MUAC ± SD(Centimetres)	11.7 ± 0.8	12.1 ± 0.8	12.7 ± 0.8
Average weight gain in Grams (Mean±SD)	NA	566 ± 389	1000 ± 499
Average weight gain in%	NA	7.3%	13.9%

Table 3: Categories of weight gain (Grams/Kg/Day) among study participants (N=76)

Category	n (%)
Children did not improve (< 1gram/kg/day)	8 (11%)
Poor catch up growth (1 to 5 gram/kg/day)	30 (39%)
Moderate catch up growth (5-10 gram/kg/day)	32 (42%)
Good catch up growth (>10 gram/kg/day)	6 (8%)
Average weight gain in 76 children	**5.2 gram/ kg/day**

As per table 3, weight gain in grams/kg/day at the time of discharge provides information on catch-up growth in children. Most of the children showed moderate catch up growth (42%), while 8% children showed good catch up growth of >10 grams/kg/day. One in ten SAM child(11%) did not improve weight and 39% children showed poor catch up growth.. Average weight gain for the cohort is 5.2 gram/kg/day for 76 children analysed.

Most important programmatic indicator for any malnutrition treatment program is to see how many children have come out of the severe malnutrition or moderate malnutrition to normal weight category. As per figure 3, 71% (54 out of 76 children) had moved from the SAM to either the MAM (63%) or Normal Category (8%) at the time of discharge. The improvement continued in follow up period as well with 92% children moving out of SAM to MAM (55%) and normal weight(37%) category (Figure 4).

Discussion:

SAM prevalence rate for the centre is found to be around 8%. Most of the socio demographic indicators are in line with the various NRC centres across country.[7-9] Previous studies have found that 3 follow-up completion rate to be around 77% compared to 89.4% in present study.[10]

Average weight gain under the program is 5.2 gram/kg/day for the study cohort. This is comparatively better than large study published from similar settings registering average weight gain to be 3.44 gram/kg/day.[10] At least 50% children had moderate catch up growth (5 gram/kg/day) in present study as compared to a study in which 21.2% achieved moderate catch up growth.[10] Nearly one fourth of children (71%) moved out of Severe malnutrition at the end of two week treatment ate centre. Nine out of ten children (92%) moved out of the SAM by the completion of eight weeks treatment.

Present study also highlights that day care setting for SAM children can also achieve findings almost similar to most of NRC studies with 14 days of indoor admissions.[8,9] This is important in improving participants' compliance in completing treatment and follow-up. Patient oriented services such as daily pick-up and drop to the house, daily wage loss payment and permission to bring young siblings have also contributed to the improved treatment completion rate.

Limitation:

Present study is based on a sample size of 76 children who have completed treatment at the centre. A study with larger sample size may provide

better results. Multivariate analysis for factors responsible for the adequate weight gain would have provided more details on causation of malnutrition.

Conclusion:

Average weight gain among the study cohort was 5.2 gram/kg/day. Around 71% children had moved from the SAM to either the MAM (63%) or Normal Category (8%) at the time of discharge. The improvement continued in follow up period as well. Present study has highlighted that day care model of care provides results comparable to 14 days indoor care model. Furthermore, present model of PPP between Government-Corporates-Academia-NGO provides sustainable model for malnutrition management in India. Scaling up such interventions across the state and country can help in reaching out to maximum number of children suffering from SAM and help them come out of the vicious cycle of malnutrition and gain normal growth cycle for improved physical and cognitive development.

Declaration:

Bal Poshan Yojana: A Novel Approach to Facility-Based Severe Acute Malnutrition Management. Cureus 14(8): e28124. DOI 10.7759/cureus.28124 has been published by Soni J, Sheikh F, Umallawala T M, Qureshi, Saha S and Ratnu A. (August 17, 2022) based on the data from three Bal Poshan Yojana centers empanelled under the scheme. Current manuscript analyzed the data from a single center i.e. Niramay Bal Poshan Kendra, Devbhumi Dwarka. This data has not been used in the above cited article and is being used for the first time.

Funding: Nil

Conflict of Interest: Nil

References:

1. UNICEF. Severe Wasting: An Overlooked Child Survival Emergency. May 2022, www.unicef.org/media/121891/file/English.pdf. [Cited 2022 Dec 28]

2. Ministry of Health and Family Welfare India Fact Sheet [Internet]. Available from: http://rchiips.org/nfhs/NFHS-5_FCTS/India.pdf. [Cited 2021 Nov 29]

3. Government of India, Press Information Bureau. Cabinet Approves Setting up of National Nutrition Mission. 1 Dec. 2017, icds-wcd.nic.in/nnm/NNM-Web-Contents/UPPER-MENU/AboutNNM/PIB_release_NationalNutritionMission.pdf. [Cited 2022 Dec 28]

4. Yasobant S, Vora KS, Shewade HD et al. Utilization of the state led public private partnership program "Chiranjeevi Yojana" to promote facility births in Gujarat, India: a cross sectional community based study. BMC Health Serv Res. 2016; 16: 266.

5. Sharma J, Osrin D, Patil B. et al. Newborn healthcare in urban India. J Perinatol. 2016; 36 (Suppl 3): S24–S31.

6. WHO. Guideline: Updates on the management of severe acute malnutrition in infants and children [Internet]. 2013. Available from: https://www.who.int/publications/i/item/9789241506328 [Cited 2021 Nov 29]

7. Shalini H, Vidya G H. A Study on the Clinicosocial Profile of Severe Acute Malnutrition Cases Admitted to Nutritional Rehabilitation Centre, Davanagere, Karnataka. Annals of Community Health. 2021; 9(2): 245-253.

8. Najar BA, Bhat MA, Rather ZE, Sheikh MA. Demographic and clinical profile of children with severe acute malnutrition: an experience from nutritional rehabilitation centre in South Kashmir. International Journal of Contemporary Pediatrics. 2021; 8(8): 1418.

9. Sanghvi J, Mehta S, Kumar R. Predicators for weight gain in children treated for severe acute malnutrition: a prospective study at nutritional rehabilitation center. ISRN Pediatr. 2014;2014:808756.

10. Rana R, Vaze G, Maitrak T. Facility Based Management of Children with Severe Acute Malnutrition (SAM): Experience of Child Malnutrition Treatment Centres in Gujarat, India. Indian J Nutri. 2019;6(1): 197.

Assessment of Cardiovascular Disease Risk among Perimenopausal Women : A Cross-sectional Study in a Rural Area of West Bengal

Chirasree Sarkar[1], Lina Bandyopadhyay[2], Ranjan Das[3], Ankush Banerjee[1], Noor Islam Bag[1], Satyabrata Maity[1]

[1]Junior Resident, [2]Advisor Public Health (SAG) and Professor (Eq), [3]Director, Professor and Head, Department of Preventive and Social Medicine, All India Institute of Hygiene and Public Health, Kolkata, West Bengal, India

Correspondence : Dr. Ankush Banerjee, Email : ankush.banerjee20@gmail.com

Abstract:

Introduction : Cardiovascular disease (CVD) has become the leading cause of mortality in the world, more so in the perimenopausal age group due to decreased levels of estrogen and diminished ovarian function because of ageing. **Objective:** To find out the magnitude of CVD risk among perimenopausal women residing in rural Bengal and its associated determinants. **Method:** A cross-sectional study was conducted in a rural area of Barasat block I during April-July 2021 on 150 peri-menopausal women selected by cluster sampling. A pre-designed pretested questionnaire was used for data collection and a 10-year probability of CVD risk was assessed using Framingham Risk Score. Logistic regression analysis was done to find out the associated factors. **Results:** Intermediate & high CVD risk was present in 28 (18.7%) and 63 (42%) participants, respectively. Among 150 participants, 62% were hypertensive, 44.7% were diabetic, 51.3% with borderline high total cholesterol and 76% had low HDL cholesterol. Factors significantly associated with intermediate to high CVD risk were high mental stress [AOR=6.96, 95%CI=2.17-22.31], family history of chronic illness [AOR=14.46, 95% CI=4.26-49.06] and presence of chronic morbidities [AOR=6.84, 95%CI=1.93-24.22]. **Conclusion:** A significant proportion of perimenopausal women were at risk of developing CVD. Thus, awareness campaigns in the community would help in empowering women in maintaining their health through regular screening and timely intervention when deemed necessary.

Key Words : Cardiovascular Risk, Framingham Risk Score, Perimenopause, Rural

Introduction:

The dawn of the 21st century has witnessed the most dramatic improvement in the promotion, prevention and management of disease and healthcare services. With increasing urbanisation and socialisation, the major causes of death and disability have undergone an epidemiological transition from infectious diseases and nutritional deficiencies towards degenerative or chronic diseases such as cardiovascular disease (CVD), diabetes and cancer, among which CVD has emerged as the leading cause of mortality worldwide. Recent data suggests stagnation in the improvement of incidence and mortality of coronary heart disease, especially among younger women (<55 years). [1,2] An estimated 17.9 million deaths are attributed to cardiovascular diseases, thus representing approximately 32% of global deaths. The World Health Organization (WHO) has predicted approximately 23.6 million deaths by 2030 due to cardiovascular diseases. [3,4]

Risk factors of CVD can be broadly classified into non-modifiable (e.g. age, family history) and modifiable (e.g. dyslipidaemia, smoking, diabetes, physical inactivity). Most of these factors are common in men as well as in women.[5] Although in general, males are significantly at higher risk of CVD than women, the perimenopausal age group in women has been recognised as an additional cardiovascular risk factor. The remarkable rise in the incidence among women especially in the perimenopausal age is because of the synergistic effect of behavioural and biological risk factors owing to changing lifestyle coupled with a loss of oestrogen protection.[6]

Recent data have shown that over the past two decades the prevalence of myocardial infarction has increased in women, especially in their mid life years. Globally, approximately 8.6 million women die from out of which 3.3 million women die of heart attacks.[3] Women especially in rural areas, being the foundation figure for each household, have to carry the burden of responsibilities of their families. In addition, they often face the challenges of poverty, illiteracy and discrimination issues due to which they often neglect their health status. Therefore, even on experiencing symptoms, they downplay or ignore them and delay in seeking healthcare.[7]

Treatment for CVDs often creates a huge financial burden on the rural as well as the poor sections of society due to high treatment and hospitalization costs.[8] Thus, preventive measures and risk reduction for CVD can act as the most cost-effective and feasible option to reduce the disease burden, especially in the case of developing nations like India. Early diagnosis through screening followed by prompt intervention can also retard the progression of the disease towards its irreversible stages.

To estimate the 10-yr probability of the risk of developing cardiovascular disease among individuals, the Framingham Risk Score was devised based on the findings of the Framingham Heart Study.[9] It considers several factors to calculate a score which determines the risk of CVD in an individual. There is a dearth of studies in India utilizing this risk score in rural areas among perimenopausal women. With this backdrop, this study thus envisaged assessing the risk of developing CVD among peri-menopausal women in a rural area of West Bengal and eliciting its associated determinants, if any.

Method:

This community-based cross-sectional study was conducted from May to July 2021 among women of the peri-menopausal age group (40-55 years) residing in a rural area of Barasat block-I, North 24-Parganas district, West Bengal. It is situated under Barasat Sadar sub-division of North 24-Parganas District, West Bengal which is well connected by train (on Sealdah-Barasat / Bongaon railwayline) and road (besides NH12 via Jessore road) with a total population of 2,94,628. The study area consisted of 68 villages from nine Gram Panchayats, namely, ChhotoJagulia, Ichhapur-Nilganj, Kotra, PurbaKhilkapur, Dattapukur I, Kadambagachi, Paschim Khilkapur, Dattapukur II, Kashimpur. The participants residing in the selected study area for at least 1 year were included in the study and those not providing written informed consent, were critically ill or had diagnosed cardiovascular diseases were excluded from the study.

Due to a dearth of available studies regarding cardiovascular risk among perimenopausal women in a rural study setting of West Bengal, the sample size was estimated considering the prevalence of cardiovascular risk to be 50%. Considering P=0.5, Z=1.96 (at 95% confidence interval) and an absolute error of precision to be 10%, the minimum sample size estimated using standard Cochran's formula came to be 96.[10] Considering a design effect of 1.5, the sample size came to be 144.

Sampling:

A two-stage cluster sampling technique was used to select the study participants. The study area consisted of 68 villages, from which in the first stage 15 villages or clusters (each village was denoted as a cluster) were selected randomly. In the second stage, it was decided to take 10 participants from each cluster (144/15=9.6~10). Thus, the final sample size came to be 150 (15×10=150). The study area was visited with the help of maps and local field health workers. After reaching the centre of each village, one direction was chosen randomly by rotating a bottle. Going in the direction of the bottle head, the first house was approached to find out any study participant satisfying the inclusion criteria. If not, then the next adjacent house was visited until 10 participants were selected from each village. In case, the end of the road was reached, the next lane was taken to complete the sample size. This procedure was followed for all 15 clusters.

Data collection, study tools and parameters :

The study was conducted via face-to-face interviews with a pre-designed structured questionnaire translated into the local language (Bengali). Pretesting of the questionnaire was performed among 30 study participants in a different rural study setting who were not included in the final analysis. The face and construct validity of the questionnaire was checked by public health experts. The questionnaire consisted of the following domains:

a. Socio-demographic characteristics of the study participants included age in completed years, educational status, religion, caste, family type, occupation and socio-economic status of the family.

b. Behavioural characteristics of the study participants included dietary behaviour, physical activity (assessed by International Physical Activity Questionnaire-Short Form questionnaire) and history of substance usage (tobacco/alcohol). Physical activity was categorised as "inactive", "minimally active" and "high" activity as per IPAQ-SF. Participants belonging to the 'inactive' to 'minimally active' category were denoted as having 'low' physical activity, while the rest were classified as having 'high' physical activity.[11]

c. Reproductive health profile comprised of questions which assessed the menstrual cycle pattern, no of childbirth, history of abortion, polycystic ovarian disease (PCOD), age at first childbirth, age of marriage, marital status, complication during pregnancy, history of contraceptive usage

d. Morbidity status assessed for the presence of comorbidities (e.g.hypertension, diabetes mellitus, obesity and dyslipidaemia), mental stress and family history of chronic disease. The presence of comorbidities was identified with the help of clinical examination (including blood pressure measurement), anthropometry and review of past medical records. Body Mass Index (BMI)was estimated and categorised as per WHO standards.[12] Moreover, laboratory investigation of certain blood parameters was performed like fasting blood glucose, serum total cholesterol and HDL cholesterol. Fasting blood glucose $\geq$ 126 mg/dl was taken as cut-off for the presence of diabetes mellitus. [13] Cut-off criteria for total blood cholesterol was taken to be 200mg/dl while HDL cholesterol less than 40 mg/dl was taken to be low or undesirable.[14] The presence of mental stress was assessed by the Perceived Stress Scale-4 (PSS-4) in which the total scores ranged from 0-16. The cut-off for high mental stress was taken to be 50% of the attainable total scores (=8).[15]

e. The outcome variable of the study was the presence of cardiovascular risk among the study participants. The cardiovascular risk was estimated by the Framingham Risk Score (FRS) in the form of an online calculator which

estimates a 10-year probability of developing heart disease. It takes into account a set of risk factors, namely age, systolic blood pressure, total cholesterol, HDL cholesterol, diabetes, smoking etc. A composite risk score is calculated in the form of a percentage value which determines the risk of developing CVD in the upcoming 10-year period. Accordingly, participants were classified into low risk (FRS<10%), intermediate risk (FRS=10-19%) and high risk (FRS $\geq$ 20%). [9]

Data analysis:

Data were analysed using Microsoft Excel (version 2019) and SPSS software (version 16 IBM Corp. USA). Continuous variables were denoted as mean±(standard deviation) or median (interquartile range) while categorical variables were denoted by frequency with percentages. After checking for multicollinearity among the variables (variance inflation factor>10), factors associated with the outcome variable were analysed using univariate logistic regression analysis. All the biologically plausible significant variables (p-value<0.05) at 95% confidence interval in the univariate analysis were then included in the final multivariable model.

Ethical issues:

Ethical clearance was obtained from the institutional Ethics Committee of All India Institute of Hygiene & Public Health, Kolkata. The purpose of the study was described and the study was conducted after taking written informed consent from the participants. Data confidentiality and privacy were maintained throughout the study. All other ethical principles as per the Declaration of Helsinki were strictly adhered to.

Results:

The mean age of the 150 study participants was 46.25 years (±4.80SD) and the majority (72.7%) of the study participants were Muslims. About 75.3 % of the participants were married. Most of the participants (79.3%) belonged to nuclear families. Among the participants, 43.3% had no formal education followed by 26.7% with a primary level of education and 22.7% of participants with middle school educational status. About 60%of participants belonged to the OBC caste. Most of the participants (82.1%) were homemakers by profession. According to the modified BG Prasad socioeconomic scale 2020, 62.7% of participants belonged to class-V socio-economic status. [17](Table 1)

Reproductive health profile

Approximately, 65.3% of participants had menarche at age $\geq$ 12 years. The majority of the participants (70.9%) were with no history of abortion and 74.7% of participants had a history of contraceptive usage. Most (71.5%) of the participants had their first childbirth at the age of <18 years. Most of the participants (76%) had <3 children while most of them (n=130) had no history of PCOD. (Table 2)

Behavioral characteristics and morbidity profile of the study participants :

The majority of the participants (77.3%) had low physical activity. Perceived stress scale scores had a median value of 10 (IQR=7-13), thus 58% of the participants were detected to have high mental stress. Around 108 study participants had unhealthy dietary behavior. Among all participants 67(44.7%) were overweight, 66% had a positive history of chronic illness and 56% had a positive family history of chronic illness. Among all participants, 62% were hypertensive and 44.7% were diabetic. Clinical examination revealed that 77 (51.3%) had borderline to high total cholesterol while most of the participants, 114 (76%) had low blood HDL cholesterol. Total 63 (42%) participants had normal fasting blood sugar levels. (Table 3)

Estimation of Cardiovascular risk among the study participants :

As per the Framingham Risk Score, 63(42%) participants had high CVD risk, 28 (18.7%) had intermediate and the rest 59(39.3%) participants were at low risk for developing CVD in the upcoming 10-year period. (Figure 1)

Table 1 : Distribution of Study Participants according to Socio-demographic characteristics (N=150)

Variables	Categories	n (%)
Age (in completed years)	40-44	55(36.7)
	45-49	50(33.3)
	50-55	45(30.0)
Religion	Hindu	41 (27.3)
	Muslim	109 (72.7)
Educational level	No Formal Education	65(43.3)
	Primary	40(26.7)
	Middle	34(22.7)
	Secondary	8(5.3)
	Higher Secondary	2(1.3)
	Graduate & Above	1(0.7)
Socio Economic Classas per modified BG Prasad scale 2020[17]	Class V	94(62.7)
	Class IV	36(24.0)
	Class III	13(8.7)
	Class II	3(2.0)
	Class I	4(2.7)
Occupation	Homemaker	123(82.0)
	Employed	27(18.0)
Family type	Nuclear	119(79.3)
	Joint	31(20.7)

Factors associated with cardiovascular risk among the study participants :

Multivariable logistic regression analysis showed that high mental stress [AOR=6.96, 95%CI=2.17-22.31], family history of chronic illness [AOR=14.46, 95% CI=4.26-49.06], presence of chronic morbidities [AOR=6.84, 95%CI=1.93-24.22] and menstrual cycle irregularity [AOR=4.08, 95%CI=1.07-15.45] to be significantly associated with the presence of intermediate to high risk of cardiovascular risk among the study participants. (Table 4) The non-significant Hosmer-Lemeshow test (p-value>0.05) indicated the goodness of fit of the model while 28-37% of the variance of the outcome variable could be explained by this model.

Discussion:

The present study made a novel attempt to assess the 10-year probability of the risk of development of CVD among peri-menopausal women in rural West Bengal and elicit its associated determinants. Although studies regarding Cardiovascular risk factors (CVRF) are available in the Indian population, however not much information is available regarding the prevalence of CVRFs in postmenopausal women.[18] The presence of intermediate to high risk of CVD was present in more than half of the study participants which exhibits the grave situation of the health status of rural women of the perimenopausal age group in our country. The mean age of the participants in the current study was

Table 2 : Distribution of Study Participants according to Reproductive Profile (N=150)

Variables	Categories	n (%)
Menstrual cycle pattern	Not Regular	108(72.0)
	Regular	42(28.0)
H/o of Abortion	Yes	44(29.1)
	No	106(70.9)
H/o of contraceptive usage	Yes	112(74.7)
	No	38(25.3)
Age at first child birth (in completed years)	<18 years	108(71.5)
	≥18 years	42(28.5)
Complication during pregnancy	Yes	56(37.1)
	No	94(62.9)
Age of Menarche (in completed years)	<12	52(34.7)
	≥12	98(65.3)
Age of marriage (in completed years)	<18	84(56.0)
	≥18	66(44.0)
Number of children	<3	114(76.0)
	≥3	36(24.0)
H/O of PCOD	Yes	20(13.3)
	No	130(86.7)
Marital Status	Married	113(75.3)
	Widowed	29(19.3)
	Separated	8(5.3)

46.25±4.80 years which was found to be quite similar to a study conducted in Faridkot, Punjab by Goyal G et al where the mean age was 44.1±2.38 years.[19]

Most of the study participants in the current study were of age 40-49 years, which appeared to be similar to a study conducted in Jammu and Kashmir by Tandon VR et al which shows most of the participants were in the age group 42-49 years, where mean age at menopause 49.35 years.[20] Tandon VR et al showed that 56% of their participants were hypertensive, 21% were diabetic, BMI≥25kg/m² found in 78% of women, and 30% were with borderline to high total blood

cholesterol(≥200 mg/dl) and 21% were with low HDL cholesterol(<40mg/dl). Similar concordant findings were also detected in the current study where 62% of participants were hypertensive, 44.7% were diabetic, 61.4% had BMI≥25kg/m², 62% with borderline to high total cholesterol(≥200 mg/dl) and 76% were with low HDL cholesterol.

In an Indian study by Kasliwal et al, diabetes mellitus was present in 55.2%, hypertension in 71.6% of women, and dyslipidemia in 93.9% of women.[21] Among all patients 29.3% of women had a family history of premature CVD, 62.9% of women had at least one family member having CVD, 1.7% of

Table 3: Distribution of Study Participants according to Behavioral and Clinical Profile (N=150)

Variables	Categories	n (%)
Comorbidities	Absent	51(34.0)
	Present	99(66.0)
Family H/O of chronic illness	Absent	66(44.0)
	Present	84(56.0)
Physical Activity	Inactive	116 (77.3)
	Minimally active	27(18.0)
	High	7(4.7)
Mental Stress	Low	63(42.0)
	High	87(58.0)
Dietary Behaviour	Unhealthy	108(71.5)
	Healthy	42(28.5)
Body Mass Index (In Kg/m^2)	Underweight (<18.5)	18(12.0)
	Normal (18.5-24.9)	40(26.7)
	Overweight (25-29.9)	67(44.7)
	Obese (≥30)	25(16.7)

women were current smokers and another 3.4% of women had a history of smoking in the preceding 1 year. In this regard, the current study found that 56% of the participants had a positive family history of chronic illness, and 64% had the presence of comorbidities. The study by Kasliwal et al also demonstrated that among all the patients 95.9% had at least one of the five major CVRFs. The alarmingly high prevalence of CVRF in rural areas is an eye-opener considering the present scenario. The presence of a positive family history of chronic diseases as well as the presence of commodities in the study participants was found to be significantly associated with the presence of intermediate to high risk of CVD among the study participants in the current study.

The incidence of myocardial infection in women, although lower than in men, increases dramatically after menopause, which can be attributed mainly to the lack of estrogen and its direct and indirect cardioprotective effects.[22] Johnson AR et al in Bangalore have found that among 1027 perimenopausal women, 11% of women had a high risk of CVD and the prevalence of CVD risk factors was high with the presence of diabetes and hypertension among 20.2% and 53.7% respectively.[23] They showed that physically inactive state, unhealthy diet, and single/separated/widowed women had a significant association with having high CVD risk. Obesity is now a well-established risk factor for CAD. Lack of physical activity and unhealthy dietary patterns are one of the major causes of central obesity among women. These findings thus emphasize the need for preventive measures and timely intervention for CVD to reduce the overall burden of the disease among women of the perimenopausal age group.

Limitations:

Since this study was cross-sectional, the causality of the factors could not be established. Some of the information collected was recall-based, hence bias might be possible.

**Table 4 : Factors associated with intermediate to high CVD risk among the study participants :
Logistic Regression Analysis (N=150)**

Variables	Category	Total	Intermediate to High CVD risk present n(%)	Unadjusted Odds ratio (95% CI)	Adjusted Odds ratio (95% CI)
Physical activity	Low	116	81(69.8)	5.52(2.40-12.83)	1.78(0.41-7.73)
	High	34	10(29.4)	1(Ref)	1(Ref)
Mental Stress	Low	63	14(22.2)	1(Ref)	1(Ref)
	High	87	77(88.5)	26.95(11.10-65.43)	6.96(2.17-22.31)
Family H/o chronic illness	Absent	66	14(21.2)	1(Ref)	1(Ref)
	Present	84	77(91.7)	40.85(15.44-108.11)	14.46(4.26-49.06)
Comorbidities	Absent	51	10(19.6)	1(Ref)	1(Ref)
	Present	99	81(81.8)	18.45(7.81-43.57)	6.84(1.93-24.22)
Menstrual cycle pattern	Not regular	108	72(66.7)	2.42(1.17-5.01)	4.08(1.07-15.45)
	Regular	42	19(45.2)	1(Ref)	1(Ref)
Diet	Unhealthy	108	65(60.2)	1(Ref)	--
	Healthy	42	26(61.9)	1.07(0.51-2.23)	--
BMI	Obese/Overweight	58	36(62.1)	1.10(0.56-2.16)	--
	Normal/Undernutrition	92	55(59.8)	1(Ref)	--

CI= Confidence interval, Hosmer-Lemeshow test of significance=0.12, Cox & Snell's R^2=0.28, Nagelkerke's R^2=0.37

Figure 1: Distribution of the study participants according to their CVD risk (N=150)
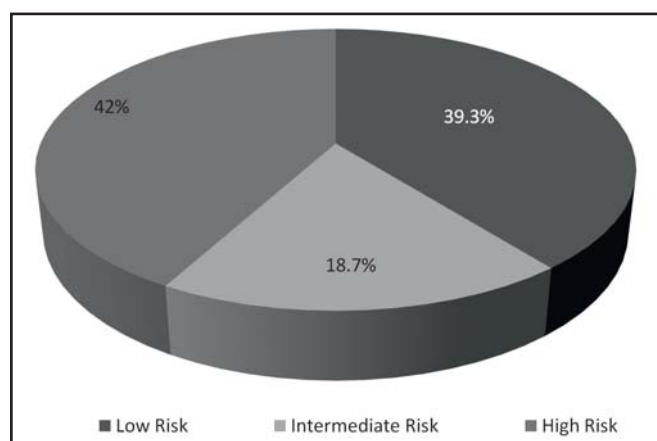
Conclusion:

The current study showed that Intermediate & high CVD risk was present in 28 (18.7%) and 63 (42%) perimenopausal women respectively. Factors significantly associated with intermediate to high CVD risk were high mental stress, family history of chronic illness and the presence of chronic morbidities and menstrual cycle irregularity among the study participants. Thus a significant proportion of women at risk of developing cardiovascular disease shortly were detected thus implying that a large number of women will be suffering from CVD events much earlier than believed.It is important to identify these cardiovascular risk factors in perimenopausal patients for early treatment of these CVRFs.

Recommendations:

Awareness campaigns at the community level with the help of field health workers can act as a possible solution to improve their knowledge and empower them to take care of their health. Those at increased risk of developing CVD such as those having chronic comorbidities or having positive family history should be counselled to visit their

adjacent health facility at frequent intervals for screening and appropriate intervention if deemed necessary. Education/ awareness regarding these CVRFs among peri-menopausal women is also the need of the hour.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References:

1. Wilmot KA, O'Flaherty M, Capewell S, Ford ES, Vaccarino V. Coronary heart disease mortality declines in the United States from 1979 through 2011: evidence for stagnation in young adults, especially women. Circulation. 2015 Sep 15;132(11):997-1002.

2. Celermajer DS, Chow CK, Marijon E, Anstey NM, Woo KS. Cardiovascular disease in the developing world: prevalences, patterns, and the potential of early disease detection. J Am Coll Cardiol. 2012 Oct 2;60(14):1207-16.

3. World Health Organization. Cardiovascular diseases. [Internet] 2017 [cited 2022, Oct 6]; Available from: https://www.who.int/health-topics/cardiovascular-diseases#tab=tab_1

4. World Health Organization. Global atlas on cardiovascular disease prevention and control: published by the World Health Organization in collaboration with the World Heart Federation and the World Stroke Organization. World Health Organization. Regional Office for Europe; 2011.

5. Park K. Park's Textbook of Preventive and Social Medicine. 26th ed. Jabalpur, Banarasidas Bhanot: Bhanot Publishers; 2021.

6. Stevenson JC, Tsiligiannis S, Panay N. Cardiovascular Risk in Perimenopausal Women. CurrVascPharmacol. 2019;17(6):591-594.

7. Saha UC, Saha KB. A trend in women's health in India--what has been achieved and what can be done. Rural Remote Health. 2010 Apr-Jun;10(2):1260.

8. Patel S, Ram F, Patel SK, Kumar K. Cardiovascular diseases and health care expenditure (HCE) of inpatient and outpatient: A study from India Human Development Survey. Clinical Epidemiology and Global Health. 2020 Sep 1;8(3):671-7.

9. Jahangiry L, Farhangi MA, Rezaei F. Framingham risk score for estimation of 10-years of cardiovascular diseases risk in patients with metabolic syndrome. Journal of Health, Population and Nutrition. 2017 Dec;36(1):1-6.

10. Saha I, Paul B. Essentials of Biostatistics and Research Methodology. 3rd ed. Kolkata: Academic Publishers; 2020

11. Lee PH, Macfarlane DJ, Lam TH, Stewart SM. Validity of the International Physical Activity Questionnaire Short Form (IPAQ-SF): a systematic review. Int J BehavNutr Phys Act. 2011 Oct 21;8;115.

12. World Health Organization. A Healthy lifestyle-WHO recommendations. [Internet] 2010 [cited 2022, Oct 10]; Available from:https://www.who.int/europe/news-room/fact-sheets/item/a-healthy-lifestyle---who-recommendations

13. World Health Organization. Global Health Observatory-Mean fasting blood glucose. [Internet] 2021 [cited 2022, Oct 10]. Available from: https://www.who.int/data/gho/indicator-metadata-registry/imr-details/2380#:~:text=The%20expected%20values%20for%20normal,and%20monitoring%20glycemia%20are%20recommended.

14. John Hopkins Medicine. Lipid Panel [Internet] 2021 [cited 2022, Oct 11]; Available from:https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/lipid-panel

15. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. J Health Soc Behav. 1983 Dec;24(4):385-96

16. MDCalc. Framingham Risk Score for Hard Coronary Heart Disease [Internet] 2021 [cited 2022, Oct 11]; Available from: https://www.mdcalc.com/calc/38/framingham-risk-score-hard-coronary-heart-disease

17. Debnath DJ. Kakkar R. Modified BG Prasad Socio-economic Classification, Updated – 2020. Indian J Comm Health.2020;32(1):124-125.

18. Gupta R, Sarna M, Thanvi J, Rastogi P, Kaul V, Gupta VP. High prevalence of multiple coronary risk factors in Punjabi Bhatia community: Jaipur Heart Watch-3. Indian Heart J. 2004 Nov-Dec;56(6):646-52.

19. Goyal G, Goyal LD, Singla H, Sheenam, Arora K, Kaur H. Subclinical Hypothyroidism and Associated Cardiovascular Risk Factor in Perimenopausal Females. J Midlife Health. 2020 Jan-Mar;11(1):6-11

20. Tandon VR, Mahajan A, Sharma S, Sharma A. Prevalence of cardiovascular risk factors in postmenopausal women: A rural study. J Midlife Health. 2010 Jan;1(1):26-9.

21. Kasliwal RR, Kulshreshtha A, Agrawal S, Bansal M, Trehan N. Prevalence of cardiovascular risk factors in Indian patients undergoing coronary artery bypass surgery. J Assoc Physicians India. 2006 May;54:371-5.

22. Dosi, Rupal et al. "Cardiovascular disease and menopause." Journal of clinical and diagnostic research : JCDR vol. 8,2 (2014): 62-4. doi:10.7860/JCDR/2014/6457.4009

23. Johnson AR, Arasu S, Gnanaselvam NA. Cardiovascular disease risk factors and 10 year risk of cardiovascular events among women over the age of 40 years in an urban underprivileged area of Bangalore City. Journal of Mid-life Health. 2021 Jul;12(3):225-231.

Study of Risk Factors for Acute Myocardial Infarction in Western Maharashtra : A Case-Control Study

Tanmay Khindri[1], Sandeep Narwane[2], Anup Kharde[3]

[1]Intern student, Dr. Balasaheb Vikhe Patil Rural Medical College, PIMS (DU), Loni, Maharashtra, India

[2]Professor, Department of Pharmacology,[3]Associate Professor, Department of Community Medicine,

Dr. Balasaheb Vikhe Patil Rural Medical College, PIMS (DU), Loni, Maharashtra, India

Correspondence : Tanmay Khindri, Email: khindritanmay@gmail.com

Abstract:

Introduction: Myocardial infarction (MI) is one of the leading causes of mortality in India. The associated risk factors vary with respect to geographical and cultural difference in patients of MI. **Objective:** To study the association between known risk factors and MI in patients visiting tertiary rural health care center. **Method:** The study design was Unmatched Case Control type. Patients of age 18 or above diagnosed of AMI were included as cases. Patients of age 18 or above without prior history of heart disease were included as controls. Pregnant women and patients with coexisting cardiogenic shock, any significant chronic medical illness was excluded. The history of hypertension, Diabetes, family history of CHD, stress in past 1 year, history of alcohol intake, History of tobacco addiction, type of activity at work were recorded. The comparison of case and controls were done using Chi square test, Fisher's Exact Test and Odds ratio, wherever applicable. An one sided "p" value of <0.05 was considered significant. **Results:** Of the 230 study participants included in the study, 100(43.5 %) were cases and 130 (56.5%) were Control, respectively. Except for history of stress, there was no statistical difference between number of cases and controls. **Conclusion:** The known risk factors of MI were not found associated with the disease. There is a need for conduct of study with larger sample size for confirmation of the study results.

Keywords : Myocardial infarction, Psychological, Risk factors, Smokeless, Smoking, Stress, Tobacco

Introduction:

Cardiovascular diseases are the one of the important causes of morbidity and mortality all over the world.[1] In 2012, the UN gave a red flag to the alarming increase in non-communicable diseases, as an important hurdle in sustainable development in the 21st century, in low and middle-income countries. [2]

Individuals of Indian origin are at a higher risk of developing Ischaemic Heart Disease (IHD) [3,4] when compared with other ethnic groups,[5,6] the cause of which remains unclear. The occurrence of conventional risk factors like tobacco addiction, hypertensive disorder and elevated cholesterol levels in Indians is comparable with other ethnic groups. [3,7-10] The proposed risk factors of IHD in Indian population, owing to its high prevalence, are elevated triglycerides, reduced HDL, insulin resistance and high visceral fat.[3,4,8,9,11] Although, these may not necessarily be associated with development of IHD and vice versa. Moreover, previous studies were conducted on migrants, whose findings may not essentially be applicable to the those residing in India. Therefore, a hospital-based case control study

of patients with a Myocardial Infarction in Rural Maharashtra, India, was planned to assess the relative importance of the risk factors for IHD.

Method:

The study design was Unmatched Case Control type and patients newly diagnosed with Myocardial Infarction admitted in Pravara Rural Hospital, Loni were the study population. The sample size of study was 230. In a study by Zodpey S P, [12] considering the probability of exposure of smoking among cases (0.68) and controls (0.56) with confidence level of 95% and 80% as power of test, the calculated sample size for cases and controls was 100 and 130 respectively.[13,14] Being a hospital based study, the patients were selected by purposive sampling. The smokers of all smoking indices were grouped together for the ease of calculation.

Patients of age 18 or above diagnosed of AMI (clinical symptoms, ECG changes, and raised enzyme levels) and admitted in Pravara Rural Hospital, Loni, willing to participate in the study were included as cases. Patients of age 18 or above without prior history of heart disease or exertional chest pain admitted in Pravara Rural Hospital, Loni, willing to participate in the study were included as controls. Pregnant women and patients with coexisting cardiogenic shock, any significant chronic medical illness (e.g., untreated hyper or hypothyroidism, renal disease, or malignancy) were excluded from both case and controls.

The study was initiated after ethical approval. The informed consent was taken before inclusion of study participants. Their demographic profile was recorded. The history of hypertension, Diabetes, family history of CHD, stress in past 1 year, history of alcohol intake was recorded. History of passive smoking (spouse regularly smoking in subject's presence or subject is exposed to smoke at workplace), past history of tobacco smoking, Smokeless Tobacco quantity frequency Index (taking into account number of tobacco chews or dips in a day), [15] Smoking Index, [16] type of activity at work [17] and total serum cholesterol were recorded. The

comparison of case and controls were done using Chi square test, Fisher's Exact Test and Odds ratio, wherever applicable. An one sided "p" value of <0.05 was considered significant.

Results:

Of the 230 study participants included in the study, 100 (43.5 %) were cases and 130 (56.5%) were Control, respectively. In the present study, the age of cases was significantly higher as compared to that of controls (p=0.0010, Mann-Whitney Test). (Figure 1)

The male and female proportion in the cases and controls was comparable (p= 0.5215, Fisher's Exact Test). Similarly, there was no statistical difference between cases and controls with respect to number of patients with family history of coronary heart disease (p=0.288, Fisher's Exact test), History of tobacco addiction (p= 0.125), History of Passive Smoking (p=0.09) and Past history of tobacco addiction (p=0.14). (Table 1)

There was no statistically significant difference in number of patients of case and controls with respect to severity in smokeless tobacco frequency index (p=0.8691, Chi square test), tobacco smoking index (p=0.8769), activity at work (p=0.0884) and total cholesterol (p=0.0718), respectively. (Table 2)

There was no statistically significant increase in odds of risk factors i.e., History of Alcohol Intake, Family History of Coronary Heart Disease, Tobacco Addiction, Gender, Total Cholesterol, History of Stress, History of Passive Smoking and Past history of tobacco smoking. (Table 3)

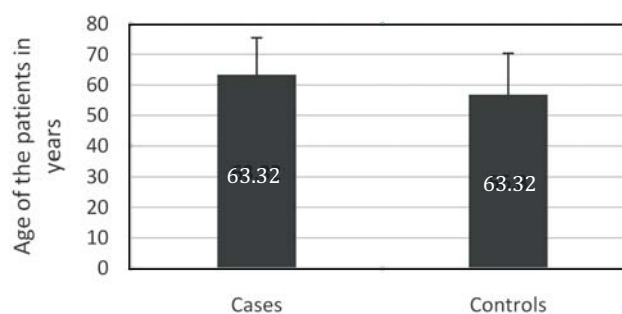**Figure 1: Comparison of mean age of Cases and Controls**

Table 1: Risk factors of the study participants

Variables	Cases (n=100)	Controls (n=130)	Total (n=230)	p value
Gender				
Female	41(41%)	54(41.5%)	95(41.3%)	0.5215
Male	59(59%)	76(58.5%)	135(58.7%)	
Family History of Coronary Heart Disease				
Absent	93 (93%)	117 (90%)	210(91.3%)	0.2888
Present	7 (7%)	13 (10%)	20(8.69%)	
History of Stress				
Absent	60 (60%)	94 (72.3%)	154(66.95%)	0.0341*
Present	40 (40%)	36 (27.7%)	76(33.04%)	
History of Tobacco Addiction				
Yes	60(60%)	67(51.53%)	127(55.2%)	0.1259
No	40(40%)	63(48.46%)	103(44.8%)	
History of Passive Smoking				
No	88(88%)	122(93.84%)	210(91.3%)	0.0933
Yes	12(12%)	8(6.15%)	20(8.69%)	
Past history of tobacco smoking [current smokers (29) were not included in the count]				
No	80(90.90%)	108(95.58%)	188(93.53%)	0.1481
Yes	8(9.09%)	5(4.42%)	13(6.46%)	
Total	88 (43.7%)	113 (56.2%)	201 (100%)	
History of Alcohol Intake				
No	85(85%)	97(74.61%)	182(79.13%)	0.0383*
Yes	15(15%)	33(25.38%)	48(20.86%)	

*Statistically significant (p<0.05), Fisher's Exact Test

Discussion:

In the present study, the age of cases (63.32±12.23 years) was significantly higher as compared to that of controls (56.8±13.61 years). Therefore, the patients of cases and controls were not age matched. Similar finding was observed in a study by Oliveria. [18]

The male and female proportion in the cases and controls was comparable (p= 0.5215, Fisher's Exact Test). Similarly, there was no statistical difference between cases and controls with respect to number of patients with family history of coronary heart disease (p=0.288, Fisher's Exact test), History of tobacco addiction (p= 0.125), History of Passive Smoking (p=0.09) and Past history of tobacco addiction (p=0.14). In previous studies conducted in India, tobacco addiction, hypertensive disorder and elevated cholesterol levels were associated with MI.[3,7-10] In a cohort study done in 5 villages by Kaur P et al, Hypertension and diabetes were associated with MI, while smokeless tobacco use was not associated with MI. However, among males, smoking and hypertension were associated with MI, while

<div align="center">

Table 2: Tobacco indices and activity at work of the study participants
</div>

Variable	Cases (n=100)	Controls (n=130)	Total (n=230)	p value
Smokeless Tobacco Frequency Index				
≤3chews/dips per day (DPD)	73 (73%)	98 (75.4%)	171(74.34%)	
4–6 DPD	18 (18%)	20 (15.4%)	38(16.52%)	0.8691*
>6 DPD	9 (9%)	12 (9.2%)	21(9.13)	
Tobacco Smoking Index				
Non-smoker	88(88%)	113(86.92%)	201(87.39%)	
Smoking Index <100	5(5%)	9(6.92%)	14(6.08%)	
Smoking Index 100-300	6(6%)	6(4.61%)	12(5.21%)	0.8769*
Smoking Index >300	1(1%)	2(1.53%)	3(1.3%)	
Activity at work				
Heavy physical work	38(38%)	53(40.76%)	91(39.56%)	
Mainly walking, climbing stairs	11(11%)	21(16.15%)	32(13.91%)	
Walking uphill, lifting heavy objects	5(5%)	12(9.23%)	17(7.39%)	
Predominantly walking on one level, no heavy lifting	44(44%)	37(28.46%)	81(35.21%)	0.0884*
Mainly sedentary Subject does not work at all	2(2%)	7(5.38%)	9(3.9%)	
Total Cholesterol				
Within normal range (< 200mg/dl)	64(64%)	96(73.84%)	160(69.56%)	0.0718**
Raised	36(36%)	34(26.15%)	70(30.43%)	

*Chi-square Test(χ2), **Fisher's Exact Test

alcohol consumption and diabetes were not associated with MI.[19] In the study by Oliveria,[18] statistically higher number of cases had the history of Dyslipidemia, Hypertension, Diabetes, history of alcohol intake and Family history of myocardial infarction.

The number of patients with history of stress in preceding year was significantly higher among cases with respect to controls (p=0.034). On the contrary, the number of patients with history of alcohol addiction were significantly higher among controls as compared to cases. Ilic M et al[20] found association between Stressful event with MI.

There was no statistically significant difference in number of patients of case and controls with respect to severity in smokeless tobacco frequency index (p=0.8691, Chi squared test), tobacco smoking index (p=0.8769), activity at work (p=0.0884) and total cholesterol (p=0.0718), respectively.

There was no statistically significant increase in odds of risk factors i.e., History of Alcohol Intake, Family History of Coronary Heart Disease, Tobacco Addiction, Gender, Total Cholesterol, History of Stress, History of Passive Smoking and Past history of tobacco smoking. In a study by Johnsen et al, no association was found between occupational physical activity and risk of MI.[21]

Table 3: Odds values for risk factors of Myocardial Infarction

Variables	Odds Value	95% Confidence Interval
History of Alcohol Intake	1.928	0.9802-3.792
Family History of Coronary Heart Disease	1.476	0.5660-3.850
Tobacco Addiction	1.41	0.8321-2.391
Gender	0.978	0.5758-1.661
Total Cholesterol	0.6296	0.3576-1.108
History of Stress	0.5745	0.3299-1.000
History of Passive Smoking	0.4809	0.1886-1.226
Past history of tobacco smoking	0.463	0.1459-1.469

In a study by Chomistek et al., high amount of alcohol intake, diabetes, hypertension and Hypercholesterolemia are associated with higher occurrence of Myocardial infarction.[22] Ilic M found association between Diabetes, Hypertension, Hypercholesterolemia, Stressful event, Family history of MI, smoking and binge drinking with MI.[20] A study conducted in the Netherlands on patients aged 65–70 years concluded that even houseworker cycling reduces the risk of coronary events and death from coronary heart disease.[23] Attard R et al. reported association between smoking, regular alcohol drinking, history of diabetes, hypertension, hypercholesterolemia with MI.[24]

To summarize, the known risk factors for MI, except history of resent stressful event, were not found significant in comparison with the controls. Sixty-one patients (47%) in the controls group were diagnosed with Cerebrovascular Accident (CVA), Alcoholic Liver Disease, Hypertension or Uncontrolled DM. The risk factors i.e., tobacco addiction, alcohol intake and hypercholesterolemia are common among MI and these diseases. This might be the reason for insignificant results found in the present study. A study with larger sample size may be required to confirm the findings of present study.

However, the number of patients with stress among cases was significantly higher as compared to controls.

Limitations of the Study:

Owing to time restricted student project, the calculated sample size could not be achieved. The present study was hospital based; purposive sampling was opted. The cases and controls were not age and gender matched. The presence of CVA, Alcoholic Liver Disease, Hypertension or Uncontrolled DM in the controls acted as confounding factors in the study.

Conclusion:

History of stress in the preceding year was associated with increased risk of Myocardial Infarction. However, history of alcoholic intake was associated with decreased risk of MI. There was no statistically significant association between the known risk factors and occurrence of MI. there is a need for conduct of study with larger sample size for confirmation of the study results.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References:

1. GBD 2016 Causes of Death Collaborators. Global, regional, and national age-sex specific mortality for 264 causes of death, 1980–2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet 2017; 390: 1151–210.

2. Ralston J, Reddy KS, Fuster V, Narula J. Cardiovascular diseases on the global agenda: the United Nations high level meeting, Sustainable Development Goals, and the way forward. Glob Heart 2016; 11: 375–79.

3. McKeigue PM, Miller GJ, Marmot MG. Coronary heart disease in South Asians: a review. J ClinEpidemiol1989; 42: 579–609.

4. Enas EA, Yusuf S, Mehta JL. Prevalence of coronary artery disease in Asian Indians. Am J Cardiol1992; 70: 945–49.

5. Sarvotham SG, Berry JN. Prevalence of coronary heart disease in an urban population in Northern India. Circulation 1968; 37: 939–53.

6. Chadha S, Radhakrishnan S, Ramachandran K, Kaul U, Gopinath N. Epidemiological study of coronary heart disease in urban population in Delhi. Indian J Med Res 1990; 92: 424–30.

7. Anon. Coronary heart disease in Indians overseas. Lancet 1986; i: 1307–08.

8. McKeigue PM, Adelstein AM, Shipley MJ, et al. Diet and risk factors for CHD in Asian Indians in Northwest London. Lancet 1985; ii: 1086–90.

9. Miller GJ, Kotecha S, Wilkinson WH, et al. Dietary and other characteristics relevant for CHD in men of Indian, West Indian and European descent in London. Atherosclerosis 1988; 70: 63–72.

10. Reddy S, Sanders TAB. Lipoprotein risk factors in vegetarian women of Indian descent are unrelated to dietary intake. Atherosclerosis 1992; 95: 223–29.

11. McKeigue PM, Ferrie JE, Pierpoint T, Marmot MG. Association of early onset coronary heart disease in South Asian men with glucose intolerance and hyperinsulinemia. Circulation 1993; 87: 152–61.

12. Zodpey SP, Shrikhande SN, Negandhi HN, Ughade SN, Joshi PP. Risk factors for acute myocardial infarction in Central India: A case-control study. Indian J Community Med 2015;40:19-26.

13. Lwanga SK, Lameshaw S. Sample size determination in health studies. 1st Ed 1991, Publ. WHO, Geneva

14. Patrikar S: In Text book of Public Health & Community Medicine 1st Ed, 2009 Ed. Bhalwar R, Dept. of Community Med. A F M C Pune, Publ. WHO India Office New Delhi

15. Mushtaq N, Beebe LA. Evaluating the role of smokeless tobacco use indices as brief measures of dependence. Addictive Behaviors 69 (2017) 87–92

16. Ministry of Health and Family Welfare, Government of India. National health policy 2017. https://mohfw.gov.in/sites/default/ files/9147562941489753121.pdf (accessed March 12, 2020).

17. Stewart RA, Held C, Hadziosmanovic N, Armstrong PW, Cannon CP, Granger CB, Hagström E, Hochman JS, Koenig W, Lonn E, Nicolau JC. Physical activity and mortality in patients with stable coronary heart disease. Journal of the American College of Cardiology. 2017 Oct 3;70(14):1689-700.

18. Oliveira A, Barros H, Maciel MJ, Lopes C. Tobacco smoking and acute myocardial infarction in young adults: a population-based case-control study. Preventive medicine. 2007 Apr 1;44(4): 311-6.

19. Kaur P, Rao SR, Venkatachalam R, Kangusamy B, Radhakrishnan E, Kaliaperumal K, Thota V, Gupte MD. Risk factors for cardiovascular disease in rural South India: cohort study. BMJ open. 2019 Oct 1;9(10):e029759.

20. Ilic M, Grujicic Sipetic S, Ristic B, Ilic I. Myocardial infarction and alcohol consumption: A case-control study. PLoS One. 2018 Jun 4;13(6):e0198129.

21. Johnsen AM, Alfredsson L, Knutsson A, Westerholm PJ, Fransson EI. Association between occupational physical activity and myocardial infarction: a prospective cohort study. BMJ open. 2016 Oct 1;6(10):e012692.

22. Chomistek AK, Chiuve SE, Jensen MK, Cook NR, Rimm EB. Vigorous physical activity, mediating biomarkers, and risk of myocardial infarction. Medicine and science in sports and exercise. 2011 Oct;43(10):1884.

23. Koolhaas CM, Dhana K, Golubic R, Schoufour JD, Hofman A, van Rooij FJ, Franco OH. Physical activity types and coronary heart disease risk in middle-aged and elderly persons: the Rotterdam Study. American journal of epidemiology. 2016 Apr 15;183(8):729-38.

24. Attard R, Dingli P, Doggen CJ, Cassar K, Farrugia R, Wettinger SB. The impact of passive and active smoking on inflammation, lipid profile and the risk of myocardial infarction. Open Heart. 2017 Aug 1;4(2):e000620.

Prevalence of Internet Addiction and the Effect of Internet Usage on Lifestyle of College Students of Haryana during COVID 19 lockdown period

Kapil Kumar[1], Deepmala Kamboj[2], Anshu Mittal[3], Anil Ahuja[1], Soorveer S. Gurjar[1], Shilpi Gupta[4]

[1]PG student, [2]Associate professor, Department of Mathematics, MLN college, Yamunanagar, Haryana, India
[3]Professor & Head, [4]Associate Professor cum Statistician, Department of Community medicine,
Maharishi Markandeshwar institute of medical science and research, Mullana, Ambala, India
Correspondence : Dr. Kapil Kumar, Email: drkambojkapil84@gmail.com

Abstract:

Introduction: Since 1990, internet usage is increasing day by day and availability of smart mobile phones and electronic gazettes like tablet, laptop etc. has given it an exponential rise. During COVID-19 lockdown period, internet usage pattern has changed a lot as per behaviour of students studying in schools, colleges, educational and coaching institutes etc. **Objective:** To study the prevalence of internet addiction and the effect of internet usage on lifestyle of college students of Haryana. **Method:** Total 1035 students, of various educational streams in various colleges of Haryana state were included in the study and data was collected by pretested self-designed questionnaire and young's internet addiction test questionnaire was used to assess its effect on life style. **Results:** Out of 1035 students, 436(42%) participants were below average users of internet, followed by 369(36%) average users and 230(22%) excessive users of internet. Average of total score of young internet addiction questionnaire was 27.72. Various life style factors like feeling stressed while working, neglects other activities, miss a diet, checks internet many times, obsessed with phone and internet usage per day were found significantly associated with internet addiction(p<0.05).
Conclusion : Excessive internet usage during COVID-19 pandemic may lead to various abnormal behavior changes which cause negative effect on various aspects of students like emotional, hyperactivity, depression, sleeping disorder etc.

Keywords : COVID 19, Internet Addiction, Lockdown, Smartphone

Introduction:

Since 1990, internet usage is increasing day by day and availability of smart mobile phones and electronic gazettes like tab, laptop etc. has given it an exponential rise. During COVID-19 lockdown period, internet usage pattern has changed a lot as per behavior of students studying in schools, colleges, educational and coaching institutes etc. They are totally dependent upon internet media for their study as well as for other entertainment purposes.

The Internet use is a crucial component of business, telecommunications, its industries, education, social media and entertainment. It is present globally and is used to find-out various purposes like information, emails, financial give and take, retail sales, porn industries and gaming, among many other uses. over usage has appear after its growing popularity in recent time and thus a new illness called, Internet Addiction (IA).[1]

Internet Addiction is a decline in the control of its use, manifested as a set of behavioural, cognitive,

and physiological symptoms. That is, the person is ''net dependent'', making excessive use of the Internet, which generates a perversion of her/his personal, family or professional goals.[2] Researchers have also found that adolescents' addiction to the Internet has resulted in many negative consequences including academic failure, poor family relationships, impaired social functioning, emotional problems, and psychiatric problems.[3] In India also, there has been a rise in the use of Internet by all age groups especially adolescents and university students.[4]

This study was carried out to assess the prevalence of Internet addiction among various educational streams of college students and to determine if there is any relationship of excessive Internet use with depression and academic performance among university students.

Method:

A cross sectional study was conducted using conventional sampling method. Study was conducted from April 2021 to September 2021.Study participants were college students of various institutions/colleges in Haryana aged18 years and above.

Sample size: As per the internet addiction prevalence[5] (25.3%) in India, Sample size of 1035 was calculated as by using the formula as N=4PQ/L^2.The sample size was calculated by taking prevalence of 25.3% and absolute error (L) of 2.65%.

Inclusion and exclusion criteria

Inclusion criteria: All undergraduate and post graduate students studying any degree course from any college of Haryana were eligible to participate in the study, Both male and female students of age groups 18 years and above were included in the study.

Exclusion criteria: Students who were not having a smart phone or not using internet by any means and students who were not willing to give consent to participate in the study.

Data collection:

Google form link of the questionnaire was sent to students through Whats App and email. Formal consent was obtained from the participants before filling this questionnaire. The study tool was a self-designed pretested questionnaire which has two parts; first part consists of various factors affecting the life style of study participants during COVID- 19 lockdown period April 2021 to September 2021. Second part consist of Internet Addiction Test (IAT) which is a reliable and valid measure of addictive use of Internet[6,7] It consists of young's internet addiction test (IAT) having a sum of 20 items ranging from 0 to 100. Internet addiction scores were calculated; the higher the score, the greater level of addiction is present. Based upon scoring, subjects were classified into<20: below average internet users, 20–49 points: an average internet user, above 50: excessive internet users.[6,7]

Statistical analysis:

The data was entered in excel sheet and analysed using SPSS version 28.0. Qualitative variables were expressed as proportions and percentages. Quantitative variables were expressed as mean and standard deviation. Finally, Chi-square test was used to establish association (if any) among qualitative variables. Association between the various quantitative variables was established using t-test or ANOVA test as per data collected, p value <0.05 was considered significant at 95% confidence interval.

Ethical consideration: Final approval from the Institutional Ethics Committee was taken.

Results:

Out of 1035 students, 65.3% were female and 34.6% were male.Majority 97% were of below 25 years age group, Majority 52.5% were of science stream followed by 28.5% from Commerce, 17% from Arts stream. Total 57.7% were from rural area and 42.2% were from urban area. Majority 97% were of smart phone users. Around 58% spent 100-300 Rs. per month for internet usage followed by 38% spent

Table 1: Association of Socio demographic profile with Internet usage among study participants (n=1035)

Variables	Below average (n=369)	Average (n=436)	Excessive (n=230)	Total (n=1035)	p value
Age group (Mean Age=20.45±2.59)					
Below 25	19(59.4%)	6(18.8%)	7(21.9%)	32(3.09%)	**0.009***
Above 25	350(34.9%)	430(42.9%)	223(22.2%)	1003(96.9%)	
Gender					
Female	243(35.9%)	279(41.3%)	154(22.8%)	676(65.3%)	0.72
Male	126(35.1%)	157(43.7%)	76(21.2%)	359(34.6%)	
Stream					
Arts	78(44.6%)	54(30.9%)	43(24.6%)	175(16.9%)	**0.034***
BCA	4(28.6%)	6(42.9%)	4(28.6%)	14(1.35%)	
Commerce	94(31.9%)	129(43.7%)	72(24.4%)	295(28.5%)	
Management	1(14.3%)	3(42.9%)	3(42.9%)	7(0.67%)	
Science	192(35.3%)	244(44.9%)	108(19.9%)	544(52.5%)	
Qualification					
Postgraduate	66(36.9%)	62(34.6%)	51(28.5%)	179(17.3%)	**0.033***
Undergraduate	303(35.4%)	374(43.7%)	179(20.9%)	856(82.7%)	
Residence					
Rural area	218(36.5%)	259(43.3%)	121(20.2%)	598(57.7%)	0.197
Urban area	151(34.6%)	177(40.5%)	109(24.9%)	437(42.2%)	

*Statistically Significant

300-600 Rs. Per month. Age group, stream of education and qualification were significantly associated with internet addiction (Table 1)

369(36%) participants were below average users of internet, followed by 436(42%) were average users, 230(22%) were of excessive users of internet as found in study results.

Various life style factors like feeling stressed while working, neglects other activities, miss a diet, checks internet many a times, obsessed with your phone and internet usage per day were found significantly associated with internet addiction(p<0.05) as shown in Table 2. The study was found out as the commonest purpose of using Internet shown in figure 1.

Discussion:

Present study was conducted to know the extent of Internet Addiction (IA) among college students in Haryana during the period of Lockdown due to COVID-19. In this study, excessive internet users were more in Arts (24.5%) and Commerce stream (24.4%) as compared with science stream (19.8%)which were similar to the results found by Kumar N et al (2018)[9] and it may be due to more study materials/books in science curriculum and number of competitive exams they had to take, hence science students had less free time to spend on the internet.

In present study majority (97%) of study participants were smart phone users. Majority

Table 2: Various life style factors associated with internet addiction (N=1035)

Variables	Below average (n=369)	Average (n=436)	Excessive (n=230)	Total (n=1035)	p value
Whether obsessed with your phone					
Never	142(51.2%)	104(37.7%)	31(11.1%)	277(26.7%)	
Often	17(19.1%)	37(41.5%)	35(39.4%)	89(8.6%)	
Sometime	197(31.8%)	285(46.1%)	136(22.1%)	618(59.8%)	<0.001*
Very Often	13(25.4%)	10(19.7%)	28(54.9%)	51(4.9%)	
Feeling stressed while working					
Never	142(48.4%)	112(38.2%)	39(13.4%)	293(28.3%)	
Often	24(25%)	37(38.5%)	35(36.5%)	96(9.4%)	
Sometime	193(32.2%)	271(45.2%)	136(22.6%)	600(57.9%)	<0.001*
Very Often	10(21.7%)	16(34.7%)	20(43.6%)	46(4.4%)	
Neglect other activity					
Never	198(47.4%)	171(41.1%)	48(11.5%)	417(40.2%)	
Often	24(21.8%)	48(43.6%)	38(34.6%)	110(10.6%)	
Sometime	136(29.4%)	201(43.5%)	125(27.1%)	462(44.8%)	<0.001*
Very Often	11(23.9%)	16(34.7%)	19(41.4%)	46(4.4%)	
Miss diet					
Never	272(41.4%)	284(43.4%)	100(15.2%)	656(63.3%)	
Often	12(19.6%)	25(40.9%)	24(39.5%)	61(5.8%)	
Sometime	78(26.7%)	118(40.5%)	96(32.8%)	292(28.4%)	<0.001*
Very Often	7(26.9%)	9(34.6%)	10(38.5%)	26(2.5%)	
Check internet how many time					
Multiple Times in a Day	31(19.6%)	64(40.2%)	64(40.2%)	159(15.3%)	
Daily	175(33.2%)	248(47.1%)	104(19.7%)	527(50.9%)	
Every Week	83(47.9%)	59(34.2%)	31(17.9%)	173(16.9%)	<0.001*
Every Month	40(40.4%)	37(37.3%)	22(22.3%)	99(9.5%)	
Once Every Three Months	40(51.9%)	28(36.4%)	9(11.7%)	77(7.4%)	
Change in internet usage during COVID-19 pandemic					
Decreases Than Before	62(41.3%)	60(40%)	28(18.7%)	150(14.4%)	
Increases Than Before	232(32.9%)	302(42.8%)	170(24.3%)	704(68.0%)	0.074
No Change	75(41.4%)	74(40.9%)	32(17.7%)	181(17.6%)	
Cost of internet					
Less than 100	16(48.4%)	12(36.3%)	5(15.3%)	33(3.1%)	
100-300	231(38.4%)	246(40.9%)	124(20.7%)	601(58.0%)	
300-600	121(30.7%)	172(43.7%)	100(25.6%)	393(37.9%)	0.043*
Above 600	1(12.5%)	6(75%)	1(12.5%)	8(1%)	
Internet usage per day					
1-2 hours	73(48.7%)	62(41.3%)	15(10%)	150(14.5%)	
2-4 hours	135(43.0%)	128(40.8%)	51(16.2%)	314(30.3%)	
4-6 hours	151(28.7%)	226(42.9%)	150(28.4%)	527(50.9%)	<0.001*
More than 6 hours	10(22.7%)	20(45.5%)	14(31.8%)	44(4.3%)	

*Statistically Significant

Figure 1: Internet usage pattern among study participants in percentage (n=1035)
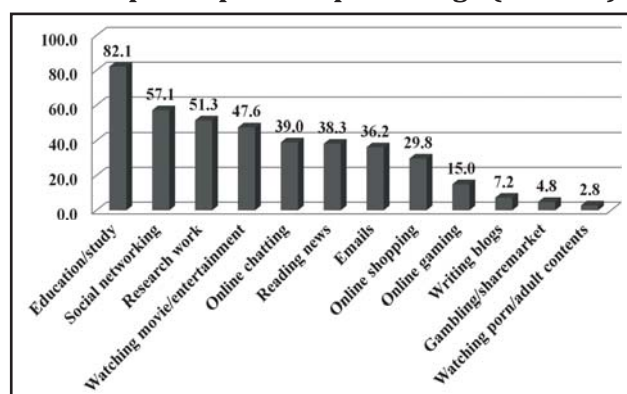
(75%) of study participants used mobile data for internet surfing while (25%) used broadband data for doing internet work. Majority (58%)of study participants spent 100-300 Rs. per month for internet usage. Similar results were observed in a study conducted by Surwase K etal(2017)[11] & Krishnamurthy Set al(2015)[12] where Expenditure done on internet usage per month was <300 Rs per month in 81% of students. Similar results with most common mode of internet access was mobile internet (78.22%) as per study as well as most commonly used gadget for internet use is smart phone in 81.63% case as seen in Surwaseetal (2017).[11]

A study conducted by Jain et al(2020)[13] in Jaipur, Rajasthan, India had reported that IA has a significant association with the educational qualification of the respondents as similar with this study. Study finding shows that, 22% of internet users show below excessive internet usage and 36% users shows average internet usage. An earlier published study from India by Nalwa K et al(2003),[14] which evaluated IA using the Davis Online Cognition Scale in school-going children aged 16–18 years, reported a prevalence of 18%. In the study of GoelD et al, (2013)[15] (by using young's criteria), 74.5% of internet users were moderate users, 24.8% were possible addicts and 0.7% were addicts. In the study of Sharma A et al(2014)[16] (IAT scoring), 57.3% were normal users, 35.0% were mild, 7.4% were moderate and 0.3% were severely addicted to the internet,

while a low rate of internet addiction was expected due to the still limited access. Most Indian students uses less internet as compared with Western countries, and may be due to differences in cultural and social traditions in India and others. Excessive internet users may be the possible addict of internet. The purpose of internet usage among college students was educational/study purpose (82%), social networking (57%), research work (51%), watching movies/serial/entertainment (47%), online chatting(39%), news reading(38.2%)and online shopping (30%) as found in our study. Niranj janRet al(2017) [17] studied the internet usage purpose in medical students in Pondicherry, India and also found similar results as in this study.

Conclusion:

Internet addiction among college students was significantly associated with age, stream, qualification, and cost of internet usage. Excessive internet usage during COVID-19 pandemic lockdown period was significantly associated with feeling stressed while working, miss a diet, neglects other activity, obsessed with phone and internet usage per day which causes negative effect on various aspects of students. To avoid these negative consequences, we should guide them to use internet only for their academic purposes.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References:

1. Navarro-Mancilla, Álvaro & Rueda-Jaimes, German, Internet Addiction: A Critical Review of the Literature. RevistaColombiana de Psiquiatría. 2007; 36:691-700.

2. Young KS,Caught in the net: how to recognise the signs of Internet addiction and a winning strategy for recovery. New York:John Willey and Sons; 2000.

3. Ko CH, Yen JY, Chen CC, Chen SH, Yen CF. Proposed diagnostic criteria of Internet addiction for adolescents. J NervMent Dis. 2005;193:728-733.

4. Kumar S, Kumar A, Badiyani B, Singh SK, Gupta A, Ismail MB. Relationship of internet addiction with depression and

academic performance in Indian dental students. Clujul Med. 2018 Jul;91(3):300-306.

5. Gupta A, Khan AM, Rajoura OP, Srivastava S. Internet addiction and its mental health correlates among undergraduate college students of a university in North India. J Family Med Prim Care. 2018 Jul-Aug;7(4):721-727. doi:10.4103/jfmpc.jfmpc_266_17. PMID: 30234044; PMCID: PMC6131995.

6. Tang J, Yu Y, Du Y, Ma Y, Zhang D, Wang J. Prevalence of internet addiction and its association with stressful life events and psychological symptoms among adolescent internet users. Addict. Behav. 2014; 39: 744– 747.

7. Young KS. Psychology of computer use: XL. Addictive use of the internet: A case that breaks the stereotype. Psychol. Rep. 1996; 79: 899– 902.

8. Widyanto L, McMurran M. The psychometric properties of the internet addiction test. CyberpsycholBehav. 2004 Aug;7(4):443-50. doi: 10.1089/cpb.2004.7.443. PMID: 15331031.

9. Kumar N, Kumar A, Mahto SK. Prevalence of excessive internet use and its correlation with associated psychopathology in 11th and 12th grade students. Gen Psychiatr. 2019 Apr 20;32(2):e100001. doi: 10.1136/gpsych-2018-100001. PMID: 31179428; PMCID: PMC6551435.

10. Prakash S, Yadav JS, Singh TB. An online cross-sectional study to assess the prevalence of internet addiction among people staying at their home during lockdown due to COVID-19. Int J Indian Psychol. 2020;8(3):424-32.

11. Surwase K, Bagdey P, Adikane H. Prevalence and associated risk factors of internet addiction in college going students in Nanded city. National Journal of Community Medicine. 2017 May 31;8(05):213-8.

12. Krishnamurthy S, Chetlapalli SK. Internet addiction: Prevalence and risk factors: A cross-sectional study among college students in Bengaluru, the Silicon Valley of India. Indian journal of public health. 2015 Apr 1;59(2):115.

13. Jain A, Sharma R, Gaur KL. Study of internet addiction and its association with depression and insomnia in university students. Journal of Family Medicine and Primary Care. 2020 Mar; 26;9(3):1700-1706.

14. Nalwa K, Anand AP. Internet addiction in students: A cause of concern. Cyberpsychology&behavior. 2003 Dec 1;6(6):653-6.

15. Goel D, Subramanyam A, Kamath R. A study on the prevalence of Internet addiction and its association with psychopathology in Indian adolescents. Indian J Psych. 2013;55:140-3.

16. Sharma A, Sahu R, Kasar PK, Sharma R. Internet addiction among professional courses students: A study from central India. Int J Med Sci Public Health. 2014 Sep 1;3(9):1069-73.

17. Niranjjan R et al. Prevalence of Internet Addiction and Effects of Social Media Usage Amonga Private Medical College Students, Pondicherry. International Journal of Current Advanced Research.2017; 06: 6486-6490.

Utilization and Satisfaction of Beneficiaries Regarding Take Home Ration Provided at Urban Anganwadis of Ahmedabad, Gujarat

Ashadevi Sisodiya[1], Fatema Kachhawala[1], Aparajita Shukla [2]

[1] Postgraduate student, [2] Professor and Head, Community Medicine Department, Smt. NHL Municipal Medical College, Ahmedabad, Gujarat

Correspondence : Dr. Ashadevi Sisodiya, E-mail: dr.asha.911@gmail.com

Abstract:

Introduction: Nutrition is fundamental to human health and development. The Take Home Ration (THR) program provides fortified rations for 6 months to 3 years normal children and severely underweight children up to 6 years, adolescent girls, pregnant women, lactating women through Anganwadis (AW). The National Nutrition Missions have targeted to decrease under nutrition by 3% each year. **Objective :** To assess the utilization and satisfaction level of beneficiaries regarding THR and to identify challenges faced by Aanganwadi Workers (AWW) related to THR. Method: A cross-sectional study was conducted at 40 Aanganwadis situated in the urban field practice area of the institute. Interview of all the (40) Anganwadi workers were conducted regarding implementation of THR Program. For assessing the utilization and satisfaction regarding THR, total 200 beneficiaries were selected from five different groups viz; 6 months to 3-year children, severely underweight children up to 6 years, Adolescent girls, Pregnant women and lactating women. Purposive sampling was used for selection of beneficiaries considering availability of beneficiaries at the time of study. **Results:** Knowledge of AWW regarding THR scheme was good. Out of 200 beneficiaries, 97.5% beneficiaries were obtaining THR packets from anganwadis, out of which 66% beneficiaries were using them regularly. Around 36% of beneficiaries weren't satisfied with THR provided to them. Major challenges faced by beneficiaries were: Lack of variety, not possible to make separate food items from THR due to time constraints and lack of knowledge. **Conclusion:** Utilization of THR among beneficiaries was not satisfactory. Most of the beneficiaries were disappointed with taste of the THR. Beneficiaries strongly recommended for improvement in taste and flavour. Awareness regarding THR scheme was satisfactory among AWW. Biggest challenge faced by AWW was to convince beneficiaries regarding intended benefits of THR and regular usage of the same.

Keywords: Anganwadi, Take Home Ration, Satisfaction, Utilization

Introduction:

Nutrition is fundamental to human health and development. Addressing malnutrition saves lives, reduces inequalities, and builds strong and resilient individuals, families, communities and eventually countries.[1]

Vision of the National Nutrition Mission (2022) targeted to decrease under nutrition by 3% each year and reduce anemia among children and women, over the next two years. The main focus of Integrated Child

Development Services (ICDS) Scheme is to improve the nutritional status of the beneficiaries (6 months to 3years children and severely underweight children up to 6 years, adolescent girls, pregnant women, lactating women).[2] ICDS scheme includes distribution of packages of Take-Home Ration (THR). Under this Program, fortified nutritious food is given to the beneficiaries in form of THR or Hot Cooked Meal to meet 1/3rd of their daily requirement.[3] The Anganwadi Worker (AWW) is the community based voluntary frontline worker of ICDS programme. They distribute packets of Bal shakti to children of 6 months to 3 years, packets of Bal Shakti to Severely undernourished children of 6 months to 6 years, packets of Purna Shakti to Adolescent girls not going to school and packets of Matru Shakti to pregnant & lactating women through Anganwadis.[4]

Double fortified sattva (DFS) salt is provided at Anganwadi center for usage during preparation of hot cooked meal and DFS is given to pregnant and lactating mothers and adolescent girls 1kg per month as THR.[5]

Effective utilization of THR products by the beneficiaries is primarily important to address the issue of malnutrition. Present study was conducted to assess the utilization and satisfaction level of THR among beneficiaries and knowledge of Anganwadiworker related to THR. Further this study also highlights the challenges faced by AWW in implementation of THR scheme.

Method:

It was a Cross-sectional study conducted at 40 Anganwadi centers situated at urban field practice area. Interview of all the (40) Anganwadi workers were conducted regarding implementation of THR Program. For assessing the utilization and satisfaction regarding THR, total 200 beneficiaries were selected from five different groups viz; 6 months to 3-year children (40), Children up to 6 years (40), Adolescent girls (40), Pregnant women (40) and lactating women (40). Purposive sampling was used for selection of beneficiaries considering

availability of beneficiaries at the time of study. The Study was conducted during the month of June and July 2022. Pre-structured and pre-tested proforma was used to assess the utilization and satisfaction level of beneficiaries about different aspects of THR products. Information regarding taste, fragrance, color, packaging and timely distribution of THR products were assessed. Open ended questions were included to analyze the challenges faced by AWW and Beneficiaries in use of THR. Informed consent was taken from the beneficiaries before conducting the interview. Beneficiaries who were not willing to participate in the study were excluded. Descriptive statistical analysis was done by using MS Excel.

Results:

This study was designed to assess utilization, satisfaction level among beneficiaries and challenges faced by AWW and beneficiaries regarding THR scheme. It was observed that all (40)AWW were having awareness about different aspects of THR scheme. Around 97.5% AWWs were aware about required quantity of dietary nutrients in daily food consumption for pregnant and lactating women, adolescents' girls and children up to 6 years age group. Major challenges depicted by AWW in implementation of THR were, lack of awareness among beneficiaries regarding benefits of THR, lack of knowledge of cooking or preparation from THR, and its poor taste. To convince beneficiaries about the intended benefits of THR was the biggest task for an AWW.

More than half (132,66%) of the beneficiaries' parents had secondary level education, followed by 39 (19.5%) and 25 (12.5%) were having primary and higher secondary education. Almost half (97,48.5%) of beneficiaries belonged to nuclear type of family, followed by 75 (37.5%) & 28 (14%) of beneficiaries had joint and three generation type of family respectively.

Knowledge of beneficiaries regarding THR contents was assessed. It was found that 197 (98.5%) beneficiaries had incomplete knowledge about

contents of THR. Most of the beneficiaries (66%) were unable to read contents on the packets and could identify only by seeing pictures present on packets.

Out of 200 beneficiaries,195(97.5%) of them procure THR packets, but only 132 (66%) beneficiaries used it regularly. (Figure 1)

Of all 120 beneficiaries (40 of each – ANC, lactating women and adolescent girls) were eligible for getting Sattva Namak, Out of them,only 70
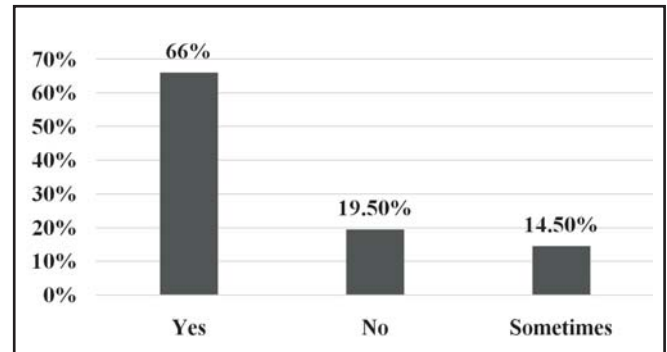
Figure 1: Utilizationof THR packets by beneficiaries (n=200)

Figure 2: Satisfaction Level of Beneficiaries towards THR (n=200)
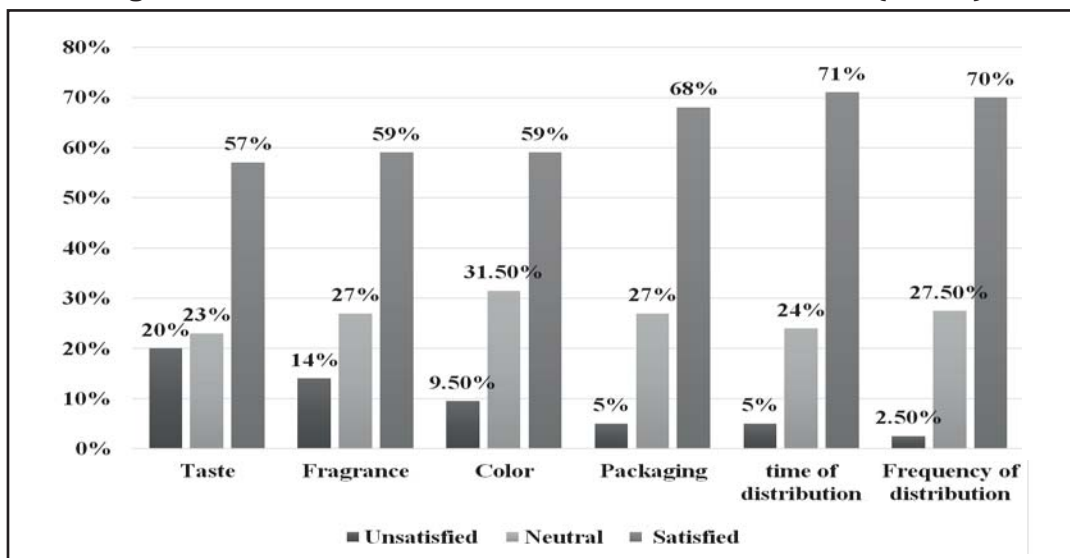
Figure 3: Challenges Faced by Beneficiaries Using THR (N=200)
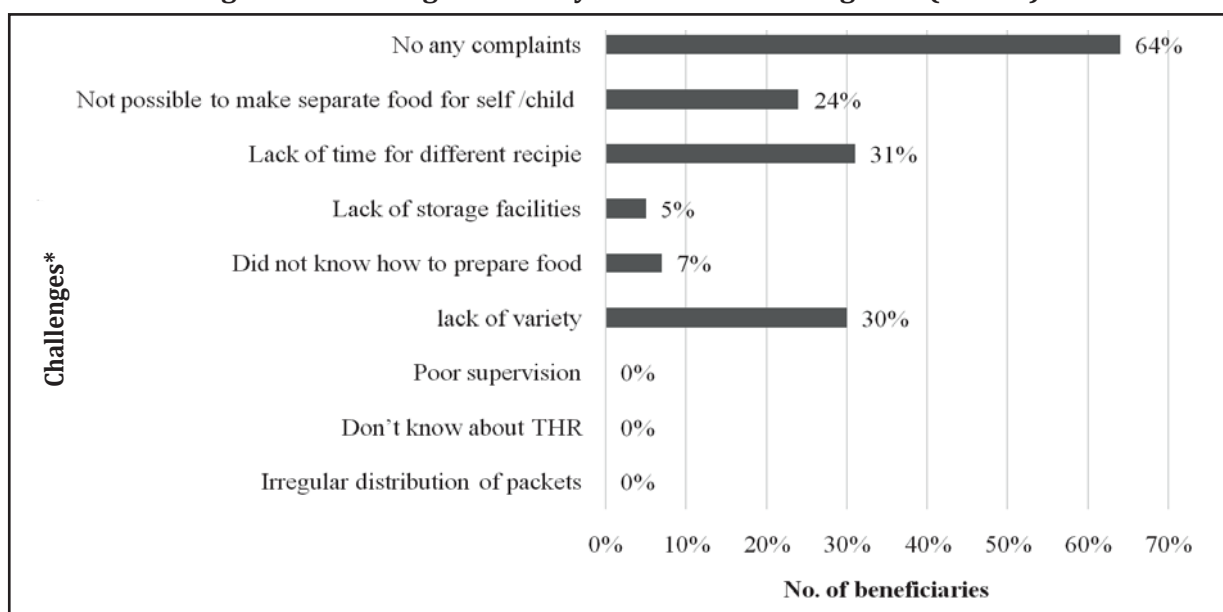
*Multiple responses

(58.3%)were using Sattva Namak. On assessing utilization of rest of the THR products among these groups, it was found that only 56% beneficiaries were utilizing all THR packets given to them.

The data presented in Figure 2 depicts analysis of satisfaction level of beneficiaries about Taste, Fragrance, Color, Packaging, Time of distribution and Frequency of distribution regarding THR food. Maximum dissatisfaction (20%) was about taste of THR, whereas maximum satisfaction was regarding timely distribution (71%), frequency of distribution (70%) and quality of packaging (68%).

As seen from the figure 3, the major challenges faced by the beneficiaries/parents regarding THR were: Lack of times for making different recipes from THR packets (62,31%), Lack of variety (60,30%), Not possible to make separate food for beneficiary (48,24%), Didn't know how to prepare food from THR packets (14,7%) and Lack of storage facilities for THR packets (10,5%). There were 128 (64%) beneficiaries who didn't have any complaints regarding THR packets.

The major important problems faced by the beneficiaries/parents using Sattva Namak were: Blackening of food (42,60%), Didn't like taste (16,22.8%) and bad smell (4,5.7%).

An attempt was also made to ascertain suggestions from the beneficiaries/parents to overcome various challenges and problems faced by them in THR usage. The major suggestions from the beneficiaries/parents to overcome their constraints in THR were: Government should provide raw food materials rather than pre mix packets (68, 34%), There should be more varieties in THR packets (60,30%), Taste of THR packets should be spicy rather than sweet (52,26%), Change in the flavors of THR packets (12,6%).

Discussion:

Integrated Child Development Services (ICDS) is India's flagship programme for Infant and Young child health, nutrition and development. Supplementary Nutrition Programme (SNP) is one of the core components of ICDS.[2] Good nutrition enables better and quick learning, contributing positively in community development. While conducting the study on THR, it was understood that the most important part in the THR scheme is the role played by the AWW, because they are the actual interface between implementing agency (government) and target group (beneficiaries).[5]

As per the interviews of AWW, it was observed that lack of awareness of the purpose and benefits of THR, lack of knowledge of cooking or preparation, and its poor taste were the major hurdles/problem faced by AWW which made it tough for them to convince the beneficiaries to actively take up THR. Apart from that, to educate the beneficiaries about the intent of benefits of THR was the biggest task for an AWW. Similar results were found in study conducted by Shweta et al who conducted a study at four districts of Maharashtra in year of 2015.[6]

Over all availability of THR packets was only 53% of total requirement in their study where as in present study, almost all beneficiaries (97.5%) received THR services. Leyvraz et al has study conducted at Telangana in year of 2016, mentioned that the coverage of the THR distribution with in the Anganwadi catchment area was very high, and high proportion of need was met by the programme.[7]

In present study 34% of beneficiaries didn't use the required number of packets. Talati et al, a study conducted at Karamsad (Gujarat) in year 2017, show that 94% mothers did not know how many packets of THR they are entitled for children over 6 months as per ICDS norms. Among those eligible for receiving THR, 60.3% used less than required number of packets;[8] According to their study, frequent users, infrequent users, and nonusers of THR packets were 11%, 28%, and 61% respectively.[9] In present study, frequent users, infrequent users, and nonusers of THR packets were 66%, 14.5%, and 19.5% respectively.

In present study 20% were not satisfied with the taste of THR. The findings were similar to that of study conducted by Talati et al (47.3%).[8] Marathe et al in their study revealed that 69.4% participants disliked the taste.[6]

Challenges on the path of beneficiaries/parents regarding THR were studied. The important challenges faced by the beneficiaries/parents regarding THR were Lack of time and lack of knowledge for making different recipes from THR packets, lack of variety, not possible to make separate food for beneficiary in joint family and lack of storage facilities for THR packets.[10] Marathe et al study mentioned that most respondents fed the THR packets to domesticated/stray animals or used it for fishing or simply threw it away, while remaining respondents mixed it with some other flour.[6] In present study, most of the beneficiaries threw it away, fed it to animals or returned it back to Anganwadi centre.

Conclusion:

Utilization level of THR among beneficiaries was not satisfactory. Majority of beneficiaries were dissatisfied with the taste of the THR. Satisfaction level was highest for time and frequency of distribution of packets. Overall knowledge of AWW regarding THR scheme was good, but their major hurdles were to make the beneficiaries aware in order to increase the utilization of THR packets. The major challenges among beneficiaries were lack of time for making separate food from THR and lack of verities in THR packets.

Limitation of the study:

Due to time constrain the purposive sampling method was used for selection of beneficiaries which limit the generalization of finding of the study.

Recommendation:

Varieties and improvement of taste of THR products would be helpful in increasing its utilization. Additionally provision of raw materials along with premix packs would be encouraging for overall improvement of THR scheme. Monitoring and evaluation of THR on a periodic basis would also be beneficial.

Acknowledgement:

Declaration:

References:

1. Kamani K. Assessment of the satisfaction level of take home ration. The Pharma Innovation Journal 2021; SP-10(5):315-323, Available from https://www.thepharmajournal.com/ [last accessed June 20, 2022]

2. Integrated Child Development Services Scheme (ICDS).Available fromhttp://icds-wcd.nic.in/icds.aspx.[last accessed July 11, 2022]

3. Comprehensive national nutritional survey. India: Ministry of Health and Family Welfare (MoHFW), Government of India, UNICEF2016-2018. Available from:https://www.unicef.org/india/media/2646/file/CNNS-report.pdf[last accessed July 11, 2022]

4. Sharma R, Shah D. Take Home Ration Under ICDS: How Much and For Whom? Indian Pediatr. 2022;59(7):521-523.

5. Evaluation Study of Take Home Ration Implemented by Women & Child Development . Centre for Economics and Statistics Administrative Staff College of India, Maharashtra: Directorate of Economics & Statistics. Available from: https://mahades.maharashtra.gov.in/files/report/THR_03.pdf [last Accessed June 20 , 2022]

6. Marathe S, Yakkundi D, Shukla A. Is take home ration really improving the nutritional status of children? A study of supplementary nutrition for under 3 children in four districts of Maharashtra. Journal of Community Nutrition & Health 2015; 4(1): 15

7. Leyvraz M, Wirth JP, Woodruff BA, et al. High Coverage and Utilization of Fortified Take-Home Rations among Children 6-35 Months of Age Provided through the Integrated Child Development Services Program: Findings from a Cross-Sectional Survey in Telangana, India. PLoS One. 2016;11(10):e0160814.

8. Talati KN, Nimbalkar S, Phatak A, Patel D. Take Home Ration in ICDS Programmes: Opportunities for Integration with Health System for Improved Utilisation Via Mamta Card and E-Mamta. BMJ Global Health 2016;1:A7-A8.

9. Baliga S, PR. A study on knowledge of anganwadi workers about integrated child development services at three urban health centers. International Journal of Community Medicine and Public Health.2017;4(9): 3283-3287. doi:http://dx.doi.org/10.18203/2394-6040.ijcmph20173829.

10. Sarwal R. Take Home Ration: Good Practices Across The State/UTs. India: NITI Aayog. (2022). Available fron www.niti.gov.in/sites/default/files/2022-06/Take-home-ration-report.pdf [last Accessed July 20, 2022]

Knowledge of Accredited Social Health Activist (ASHA) Workers Regarding Maternal Health Services: A Comparative Study between Rural and Urban Areas of a Block of Haryana

Seema Sharma [1], Amit Kumar [2], Divyae Kansal [3], Sneh Kumari [3], S M Pandey [4]

[1]Professor, [2]Post Graduate student, [3]Associate Professor, [4]Assistant Professor (statistics), Department of Community Medicine, Maharaja Agrasen Medical College, Agroha, Haryana, India

Correspondence : Dr. Sneh Kumari, Email:ss4_gunu@yahoo.co.in

Abstract:

Introduction: All people, everywhere, deserve the right care, right in their community. In any community, maternal mortality ratio strongly reflects the overall effectiveness of health systems. To increase utilization of existing health services, Accredited Social Health Activist (ASHA) is the key component of the National Rural Health Mission. **Objective :** To assess any compare the level of knowledge of ASHA workers regarding maternal health services in between rural and urban areas of a block of Haryana. **Method:** The present cross-sectional, community-based study was conducted in block Barwala, district Hisar of Haryana. The assessment of knowledge of ASHA workers was done on the basis of scoring. Appropriate statistical tests like percentages and chi-square (χ2) test were applied. **Results:** Regarding maternal health services majority of ASHA workers had good knowledge, assessed by score gained by them and none of them was having poor knowledge about maternal health services. However in rural area, score gained was better than urban area & the observed difference was found to be statistically significant. Knowledge of identification & treatment of anaemia and identification of danger signs during pregnancy were inadequate among ASHA workers of both areas. **Conclusion:** Knowledge of ASHA workers was inadequate as far as anaemia and danger signs during pregnancy were concerned. Frequent and regular refresher training should be organized in their working area.

Keywords: ASHA workers, Danger signs, Maternal health services, Rural, Urban.

Introduction:

All people, everywhere, deserve the right care, right in their community. The primary health care is an approach that includes health promotion, disease prevention, treatment, rehabilitation and palliative care.[1] In any community, mothers and children constitute a priority group as a part of mother and child health (MCH). These groups (i.e., children under the age 5 years and women in the reproductive age group (15-44 years) comprise about 32.4 per cent of the total population in India.[2] The National Rural Health Mission (NRHM) has created a cadre of trained female community health activists called Accredited Social Health Activist (ASHA) to strengthen the health care system and to mobilize community towards increased utilization of existing health services.[3] Maternal mortality ratio strongly reflect the overall effectiveness of health systems. Maternal mortality and infant mortality are the main health indicators of any civilized society.[4] To increase utilization of existing health services, ASHA is the key component of the National Rural Health Mission.

Assessment of ASHA's knowledge should be done regularly to strengthen this grass root level link worker and their activities. A time-to-time assessment of knowledge of ASHA is essential as the success of national health programmes launched by Government of India in rural and urban areas. Considering the above facts the present study was planned with objective to assess and compare the level of knowledge of ASHA workers regarding maternal health services in rural and urban areas of a block of Haryana.

Method:

The present cross-sectional study was conducted in block Barwala, district Hisar of Haryana, which is a field practice area of the Department of Community Medicine, Maharaja Agrasen Medical College, Agroha (district Hisar). The study was conducted during January 2022 to June 2022.All ASHA workers (rural area=70 & urban area=30) under National Health Mission were trained as per module 2 (maternal & child health services) and were having experience of 6 months and above had been included in the study. A predesigned, pretested, semi-structured schedule was used to collect the information. It was prepared in English and Hindi languages. The proforma included details of socio-demographic profile of ASHA workers and questions about knowledge of maternal health services like early registration of pregnancy, antenatal visits, various danger signs during pregnancy, Janani Suraksha Yojana (JSY), preparedness of birth, danger signs during pregnancy. Official permission for the study was obtained from Senior Medical Officer of Community Health Centre (CHC) Barwala. Details of Primary Health Centre (PHC) in-charges & ASHA workers had been obtained from Senior Medical Officer of block Barwala. The schedule for interview was prepared. After explaining the purpose of the study and obtaining informed consent from the participants, the interview was conducted at village level depending on availability of ASHA worker by explaining them question in their own language one by one. The confidentiality of the information was assured.

The assessment of knowledge was done on the basis of scoring. For each correct response score one (1) was given & incorrect response was awarded zero (0). Information regarding maternal services consists of total 15 questions. The range of scores for maternal health was 0-15.Scoring was categorised as; 0-5 poor knowledge, 6-10 average knowledge and 11-15 good knowledge of maternal health services.

The data thus collected was first coded, then entered and compiled in the MS excel sheet. Statistical analysis was carried out using Statistical Package for Social Sciences (SPSS) Software Version 20.0. Appropriate statistical tests (percentages& chi-square test) were applied in order to draw relevant inference. $P<0.05$ was considered as level of significance statistically.

Age group wise distribution of study subjects display that in rural area majority of ASHA workers (55.7%) were >36 years old, however equal participation of each category of age group is seen in urban area. Mostly ASHA workers were married. In rural area majority of ASHA workers (37.2%) belonged to backward caste however in urban area 50% belonged to schedule caste. More than half (51.4%) were educated up to high school in rural area whereas 46.7% were educated till senior secondary in urban area. Majority of ASHA workers were having >5 years of work experience. (Table1)

Regarding maternal health services majority of ASHA workers had good knowledge, assessed by score gained by them and none of them was having poor knowledge about maternal health services. However in rural area score gained was better than urban area & the observed difference was found to be statistically significant. (Table 2)

Table 3 shows that knowledge regarding early registration of pregnancy and ANC visits was found to be adequate among ASHA workers of both rural and urban areas. However knowledge of identification & treatment of anaemia was inadequate among ASHA workers of both areas. Majority of ASHA workers either working in rural or urban areas, were having inadequate knowledge about identification of danger

Table 1: Socio-demographic profile of ASHA workers (N=100)

Characteristics		Area	
		Rural (n=70)	**Urban (n=30)**
Age group (Years)	≤ 30	8 (11.4)	9 (30.0)
	31-35	23 (32.9)	11 (36.7)
	≥ 36	39 (55.7)	10 (33.3)
Caste	General caste	22 (31.4)	1 (3.3)
	Backward Caste	26 (37.2)	14 (46.7)
	Schedule Caste	22 (31.4)	15 (50.0)
Marital Status	Married	66 (94.3)	27 (90.0)
	Widow	4 (5.7)	3 (10.0)
Education	Middle School	10(1.43)	4(13.3)
	High School	36(51.4)	12(40.0)
	Senior secondary	24(34.3)	14(46.7)
Work Experience	<5 years	8 (11.4)	4 (13.3)
	>5 years	62 (88.6)	26 (86.7)

(Figures in parentheses indicate percentages)

Table 2: Area wise distribution of ASHA workers based on scores gained by them regarding knowledge of maternal health services (n=100)

Area	Good knowledge	Average knowledge	Total	p Value[#]
Rural	58 (82.9)	12 (17.1)	70(100)	0.014 (Significant)
Urban	18 (60)	12 (40)	30 (100)	

(Figures in parentheses indicate percentages)   #Chisquare test applied as a test of significance

Table 3: Knowledge of ASHA workers regarding maternal health services during home visits (N=100)

Maternal health services	Rural n=70 (100)		Urban n=30 (100)		p-value[#]
	Adequate Knowledge	Inadequate Knowledge	Adequate Knowledge	Inadequate Knowledge	
Early registration of pregnancy	67 (95.7)	3(4.3)	30 (100)	0.0(0)	0.250
Minimum ANC visits	69 (98.6)	1 (1.4)	30 (100)	0.0 (0)	0.511
Identification of anaemia & treatment	10 (14.3)	60(85.7)	6(20.0)	24(80.0)	0.475
Immunization during pregnancy	57(81.4)	13(18.6)	17(56.7)	13(43.3)	0.010*
Five cleans	29(41.4)	41(58.6)	5(16.7)	25(83.3)	0.017*
Danger signs during pregnancy	2 (2.9)	68 (97.1)	1 (3.3)	29(96.7)	0.898

*Statistically significant   #Chisquare test applied as a test of significance

signs during pregnancy. Most of rural ASHA workers (81.4%) had adequate knowledge regarding immunization during pregnancy however about half of ASHA workers working in urban area had adequate knowledge and this difference of level of knowledge was found to be statistically significant (p=0.01). ASHA workers had inadequate knowledge of five cleans whether working in rural or urban area, however level of knowledge was somewhat better among ASHA worker working in rural area and this difference was found to be statistically significant (p=0.017).

Discussion:

The present study was conducted to assess the level of knowledge of ASHA workers regarding maternal health services in rural and urban areas of block Barwala, district Hisar of Haryana. No study of ASHA workers working in urban areas was found so all the studies which are compared with this study were related to knowledge of ASHA workers working in rural areas.

In the present study, in rural area majority of ASHA workers (55.7%) were >36 years old, however equal participation of each category of age groups is seen in urban area. Singhal P et al[5] found in their study that 52.7% of ASHA workers were in the age group of 30-39 years. Sugandha BK et al[6] and Grover K et al[7] observed that majority (51.9% & 62.12% respectively) of study subjects belonged to younger age group as compare to our study. Pal J et al[8] and Ratnam AL et al[9] found that majority (98.9%) of ASHA workers were in the age group of 40-50 years, which was older age group than observed in our study.

Mostly ASHA workers were married (rural-94.3%, urban-90%) in the present study similar finding was observed by Grover K et al,[10] Nagaraj S et al,[11] Shashank KJ et al.[12] Sugandha BK et al [6] in Mysuru, observed that among ASHA workers, 86.4% were married which is lower than the present study.

In this study, more than half (51.4%) workers were educated up to high school in rural area whereas 46.7% were educated till senior secondary in urban area. Grover K et al[10] observed that 95% ASHA workers were educated up to high school or above. Bajpai N et al[13] observed that nearly 90% of ASHA workers had completed eight years of schooling & similarly Sexena S et al[14] were found that majority of participants (70.3%) were educated up to middle school which is quite different than this study. However Shet Set al[15] observed that majority of the ASHA workers (65%) have finished secondary level of education.

In this study majority of ASHA workers were having >5 years of work experience similar findings were observed by Grover K et al,[10] Singhal P et al[5] and Choudhary ML et al.[16] Bhandhari DJ et al[17] and Valiveti PDSK et al[18] observed in their study most of ASHA workers were working for more than 4 years & 2.4 years respectively which was lesser than the present study. The observed difference in work experience may be due to different time of selection of ASHA workers in different geographical areas.

Regarding maternal health services majority of ASHA workers in this study had good knowledge, assessed by score gained by them and none of them was having poor knowledge. However in rural area score gained was better than urban area. Choudhary ML et al[16] observed that almost half of the ASHA workers (47.9%) had average knowledge and Sugandha BK et al[6] observed that among ASHA workers 30.8% had good knowledge and 43.4% had average knowledge. In the present study about 3% ASHA workers either working in rural or urban areas, were having adequate knowledge about identification of danger signs during pregnancy. In contrast this a much higher percentage of ASHA workers knew about danger signs during pregnancy in study conducted by Kohli C et al[19] (80%) and Sugantha BK et al[6] (49.5%).

In this study knowledge of identification & treatment of anaemia was inadequate among ASHA workers of both areas.Shet S et al[15] found that 80% of the ASHAs were aware about the importance of vitamin and iron supplementation during pregnancy &Shashank KJ et al[20] observed that 90% of ASHA workers agree that Iron tablets should be provided to pregnant women.In the present study knowledge regarding ANC visits was found to be adequate among ASHA workers of both rural and urban areas. Same findings are observed bySugandha BK et al.[6] A lower percentage (79.5%) of knowledge of ASHA workers regarding minimum number of ANC visits was observed by Shashank KJ et al.[20]In this study most of rural ASHA workers (81.4%) had adequate knowledge regarding immunization during pregnancy however about half of ASHA workers working in urban area had adequate knowledge. Shashank KJ et al[20] and Sugandha BK et al[6] observed in their study 100.0% and 96.6% study participants respectively knew about vaccine given during pregnancy which is better than our study.

Conclusion:

In this study authors concluded that in spite of work experience more than 5 years, majority of ASHA workers did not have adequate knowledge of identification of danger signs during pregnancy. Even they did not know how to identify anaemia during pregnancy & how to treat it. So frequent and regular refresher training should be organized in their working area.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References:

1. World Health organization [internet]. Primary health care. Available from: https: //www.who.iny/health-topics/primary-health-care#tab= tab_1 [Last Accessed 2022 Aug 09]

2. Park K Park's Text Book of Preventive and social medicine.26th edition: Jabalpur: M/s B.Bhanot; Mar.2021.page 638.

3. Parks K Park's Text Book of Preventive and social medicine.26th ed: Jabalpur: M/s B.Bhanot; Mar.2021.page 504

4. Khes SP, Sahu D, Soni GP, Chandrakar A. A study to assess awareness about Janani Suraksha Yojana among beneficiaries of urban slums of Raipur city, Chhattisgarh. Int J Community Med Public Health 2017; 4:2423-7.

5. Singhal P, Majra JP, Jha SK. Performance of accredited social health activists for maternal health component of their job responsibility in a rural block of Sonipat district of Haryana: a cross-sectional study. Int J Community Med Public Health 2020;7:1-6.

6. Sugandha B.K, Jagannath P. Knowledge of ASHA workers about maternal and child health services in Mysuru. Public health Rev: Int J Public health Res 2019;6(4): 169-76.

7. Grover K, Khanna P, Chayal V, Verma R, Kapoor R, Kumar T, et al. Evaluation of home-based postnatal care provided by accredited social health activist worker in a rural community of Haryana: a cross-sectional study. Int J Community Med Public Health 2019; 6:5123-8.

8. Pal J, Roy S, Nandi S, Satapathy S. Assessment of knowledge and practices of ASHA workers related to maternal-child health and their performance affecting factors: a mixed method study in Deganga block, North 24 parganas district, West Bengal, India. Int J Res Med Sci 2019; 7:3672-8.

9. Ratnam AL, Kumaran JA. Awareness of family planning services among ASHA workers in a municipality of northern Kerala. Int J Community Med Public Health 2018; 5:3413-7.

10. Grover K, Khanna P, R Kumar, Verma R and Chayal V.Birth Preparedness and Knowledge of ASHAs regarding danger signs of pregnancy in rural India: A cross sectional study. Int. J. Res. Dev. Pharm. L. Sci. 2017; 6(7):2850-2855.

11. Nagaraj S, Achapppa S, Bettapa P,Prakash B . Performance Evaluation of Accredited Social Health Activist under National Rural Health Mission in Mysore District: A Cross-Sectional Study. Natl J Community Med 2017; 8(6):324-328.

12. Shashank KJ, Angadi MM. A study to evaluate the knowledge of ASHA workers on antenatal and postnatal care in Bijapur district. Int J Res Med Sci 2015;3: 2299-302

13. Bajpai N, Dholakia RH. Improving the performanceof accredited social health activists in India. NewYork, NY: Columbia University, 2011:40-1. (Working paper no. 1). [http://globalcenters.columbia.edu/mumbai/files/globalcenters_ mumbai/Improvingthe_Performance_of_ASHAs_in_India_CGCSA_Working_Paper_1.pdf, accessed on 2022 Aug. 12.

14. Saxena S, Singh AK, Maheshwari S, Gupta SB. Appraisal of knowledge of ASHA regarding child health services provided

under NHM in Bhojipura block, District Bareilly. Int J Community Med Public Health 2017; 4:3705-11

15. Shet S, Sumit K, Phadnis S. Study on assessment of ASHA's work profile in the context of Udupi Taluk, Karnataka, India Clinical E and Global Health 6 (2018) 143-147.

16. Choudhary ML, Joshi P, Murry L, Malhotra S, Shankar J. Knowledge and skills of accredited social health activists in home-based new-born care in a rural community of Northern India: an evaluative survey. Int J Community Med Public Health 2021; 8:334-8.

17. Bhanderi DJ, Varun AR, Sharma DB. Evaluation of accredited social health activists in Anand District of Gujarat. J Family Med Prim Care 2018; 7:571-6.

18. Valiveti PDSK, Vinjam BN, Bandarupalli T, Rachamadugu NR. A cross sectional study of the knowledge, attitude and practice of asha workers in implementation of Janani Suraksha Yojana in Tadikonda Mandal, Guntur, Andhra Pradesh, India. Int J Res Med Sci 2017; 5:551-3.

19. Kohli C, Kishore J, Sharma S, Nayak H.Knowledge and practice of Accredited Social Health Activists for maternal healthcare delivery in Delhi. J Family Med Prim Care 2015;4:359-63.

20. Shashank K J, Mahabaleshwar Mahantappa Angadi. A Study to evaluate the Knowledge of ASHA workers on antenatal and postnatal care in Bijapur district. Int.J Res Med sci.2015Sep; 3(9):2299-2302.

Hygiene Predictors among COVID-19 Screened Individuals during the First Wave in Mumbai: A Cross-Sectional Survey

Rujuta Hadaye[1], Shilpa Nellikkal [2]

[1] Professor, [2]Resident Medical Officer, Department of Community Medicine, Seth G. S. Medical College and KEM Hospital, Mumbai, Maharashtra, India

Correspondence : Dr. Shilpa Nellikkal, Email: shilpa.nel@gmail.com

Abstract:

Introduction: The most important lesson COVID-19 pandemic taught is basic hygiene practices. It is important to understand hygiene practices among patients during first wave, when meager knowledge about the management of COVID-19 was available. **Objective:** To assess the adopted behavioral practices and predictors for COVID-19 infection among screened individuals during the 1st wave. **Method:** A cross-sectional study included COVID-19 screened individuals attending COVID -19 screening OPD at Mumbai. Total 950 participants were interviewed telephonically using convenient sampling method. Logistic regression nanalysis was performed. **Results:** A total 950 respondents participated, with median age of36 years (range:18yrs to 83 years). Respondents,RTPCR positive or quarantined were 36%. Analysis concludes that practices of having seen or read about hand hygiene, face hygiene, maintaining social distancing, cough etiquettes and enforcement of strict lockdown were significantly associated with lower risk of COVID-19 infection (p value <0.05). **Conclusion:** Hygiene Practices were followed correctly by more than 50% of this cohort however few individuals were able to answer knowledge related questions correctly. Simple hygiene practices like face hygiene, cough etiquettes, social distancing, strict following of lockdown and having seen or read information on hand washing were predictors of COVID-19 infection. The study highlights the need for quick and rigorous attempts to educate people during a state of a health emergency.

Keywords: COVID-19, Hygiene predictors, Practices, Pandemic

Introduction:

In India, the state of Kerala identified its first COVID-19 case in January 2020.[1] When the first nationwide lockdown was implemented on March 24th, 2020India had 519 cases which increased to 12,000 cases mid-April, 2020. The screening of international travelers started in early March 2020 and International flights were stalled from March 22nd, 2020.[2] Higher incidence and mortality were noted in Maharashtra.

Mumbai city early on in the pandemic was noted to have the highest number of cases. Mumbai city is the most important entry point to India with a dense population. It is also an epicenter for migrant workers and laborers and about 41% of people reside in slums. Screening forCOVID-19 in the city was limited to Kasturba Infectious Disease hospital.[3] It was the first authorized centers to screen, test and treat individuals for COVID-19. Other centers gradually opened as the number of cases started rising.

In the beginning of the pandemic, very few people knew about the importance of hand washing, using masks, sanitizers, maintaining physical distance, and quarantine.[4] Studies were conducted to assess the knowledge, attitude, and practices (KAP) towards COVID -19 in the community and outdoor and indoor patients elsewhere in India.[5–8] Present study was conducted to know how exactly people who tested positive differed in their adopted behavioral practices from those who did not, especially in city like Mumbai during the beginning of the pandemic.

Method:

A cross sectional study was conducted by conducting telephonic interview of individuals who visited the COVID-19 screening OPD from April 1st to April 30th, 2020. Their contact numbers were obtained from the records.Early in the pandemic RTPCR testing was restricted to International travelers to specific countries, symptomatic individuals and contacts of RTPCR confirmed cases. Participants declared RTPCR positive or were advised home quarantine based on clinical suspicion were grouped together and compared with those who screened negative.Since no study or data was available, through convenient sampling, 1000 participants were anticipated. Out of 1467 mobile numbers contacted, 517 mobile numbers were wrong, out of network or switched off. The final sample size of 950 respondents was achieved.

Approval for study (EC/OA-71/2020) from Institutional Ethics Committee (IEC) was taken. Additionally, permission from Institutional Head of Kasturba Hospital was taken.

Study tool and analysis:

An interview schedule was developed with the help of government approved training materials related to COVID-19. Verbal consent was taken prior to starting the interview. The interview was conducted in Hindi, Marathi, or English, depending on the participant's language preference.For initial

analysis chi-square test was used. The KAP that were significant (<0.05) further underwent binomial regression analysis. Statistical software IBM SPSS version 28 was used for analysis.

Results:

Out of 950 individuals, 79 % (754) respondents were males. The median age was 36 years (18 years to 83 years) (males=36 years, females=33 years). (Table 1)Total number of individuals who detected COVID positive was 342 (36%). Correct hygiene measures followed by COVID positive individuals were as follows; proper hand hygiene 269 (78.6%), adequate time taken while applying soap 247 (72.2%) , soap used for washing up to elbow 294 (85.9%), used sanitizers 313 (91.5%), minimum alcohol content in sanitizer 134 (39.1%), waiting after application of sanitizer 153(44.7%),washing hands more frequently162 (47.3%), not touching face, nose and mouth 269 (78.6%),using flexed elbow while sneezing 140 (40.9%), appropriate masks usage 181(52.9%), maintaining social distancing always 134 (39.1%), followed lockdown strictly 115 (33.6%) and took hydroxychloroquine prophylaxis 37(10.8%).During initial analysis parameters that significantly differ from the screened negative individuals were education, religion, working for essential services, practice of face hygiene, spread of COVID-19, seen or read information of hand washing, frequency of hand hygiene, using flexed elbow while coughing/sneezing, maintain social distancing, and following lockdown. On regression analysis, factors significantly associated with risk of infection were; having seen or read documents on hand hygiene practices, face hygiene, strictly following lockdown, following cough etiquettes and maintaining social distancing always. (Table 2) It was also noted that large number of individuals contacted the Government approved helpline '1916' (60.8%) and downloaded the 'Arogya Setuapplication' (37.6%). The most common source for COVID-19 related information was news channels (43%).

Table 1: Demographic Characteristics of COVID-19 Positive and Negative Individuals (N=950)

Demographic variables	COVID-19 infection		Total
	Yes (n=342)	No (n=608)	
Age (Years)			
18-40	213 (34.9)	398 (65.1)	611
41-60	119 (37.9)	195 (62.1)	314
>60	10 (40)	15 (60)	25
Gender			
Male	268 (35.5)	486 (64.5)	754
Female	74 (37.8)	122 (62.2)	196
Education			
Uneducated	3(21.4)	11(78.6)	14
Primary & Secondary	72(38.3)	116 (61.7)	188
Higher secondary	119(29.1)	290 (70.9)	409
Graduate	145 (46.9)	164 (53.1)	309
Professional	2 (18.2)	9(81.8)	11
Ongoing	0 (0)	6 (100)	6
Did not disclose	1 (7.7)	12 (92.3)	13
Working for essential services			
Yes	93 (46)	109 (54)	202
No	249 (33.3)	499 (66.7)	748
Religion			
Hindu	271 (37.5)	452 (62.5)	723
Muslim	52 (35.1)	96 (64.9)	148
Christian	8 (66.7)	4 (33.3)	12
Did not disclose	11 (16.4)	56 (83.6)	67

Discussion:

The present study was conducted during the initial stage of COVID -19 Pandemic to find out the hygiene practices among individuals who visited the COVID-19 screening OPD. Even though it was early in the pandemic a large number of individuals were screened positive (36%).

It was found that, majority of the respondents were males between 18-40 years, this could represent the male predominance among the working community. Acharya et al and Srivastava et al who conducted the similar studies at West Bengal and North Eastern states also found male preponderance.[5,6] In present study, majority of respondents were having lower educational status. Similar finding was observed in the study conducted by Gupta et al in North India.[7] Despite the lower educational status among the study cohort, correct responses for hygiene practices ranged from 54 % to 88% but few participants correctly answered

Table 2 : Knowledge, Attitudes and Practices of Hygiene Measures among Respondents

Hygiene measures	COVID-19 infection			Odds Ratio B-Coefficient (95%CI)	p value
	Yes (n=342)	No (n=608)	Total		
Knowledge of spread of COVID-19 infection					
Airborne, fomites and droplets	10(2.9)	7(1.2)	17	0.790 (0.283-2.204)	0.652
Droplets /fomites or both	247(72.2)	475(78.1)	722		
Others	10(2.9)	17(2.8)	27		
Don't know	75 (21.9)	109(17.9)	184		
Hand hygiene					
Read or seen any official document or information about hand hygiene technique	269(78.7)	388(63.8)	657	0.567 (0.401-0.801)	0 .001
Frequency of washing hands / or using sanitizer (10 or more)	230(67.3)	401(66)	631	0.948 (0.659-1.363)	0.773
Face hygiene					
Washing face more frequently	162(47.4)	362(59.5)	524	1.348 (1.009 -1.802)	0.043
Face -mask usage and cough etiquettes					
Covering of mouth while coughing or sneezing	140(40.9)	189(31.1)	329	0.658 (0.484-0.894)	0.007
Social distancing					
Maintaining at least 1 meter distance(always)	134 (39.2)	299(49.2)	433	1.472 (1.087- 1.992)	0.012
Following lockdown					
Followed lockdown (100% or fully)	115 (33.6)	28 (4.6)	399	1.434 (1.049-1.962)	0.024

knowledge related questions. A large number of individuals were aware of the practices without having the background knowledge for the same. Other studies showed higher rates of correct responses as far as hygienic practices were concerned.[5-9] These findings may be used to guide future IEC interventions.

Knowing the importance of respiratory hygiene was only restricted to medical professions and workers but with the onset of the pandemic it had become essential for every individual to know and follow them. News channels seemed to the commonest source of information similar to other studies, however lack of common pre-defined authorized IEC material could have led to many of the misconceptions and lack of adequate knowledge.

Lack of internet availability in phones, insufficient memory space and not finding the app usefulness, many individuals deleted the Arogya Setu app. Individuals who migrated to the villages followed lesser mask usage. Individuals working outdoors found it difficult to access water and soap, as they found sanitizers expensive. Usual responses heard for social distancing was that surrounding people did not follow distancing even though they tried.

Strengths and Limitations of the study:

The telephonic interview led to safely collecting data during a pandemic. It is also beneficial for collecting additional information, clear doubts and reaching the lesser educated individuals which were not possible through an online Google form. The study conducted during the initial phase of pandemic, practices might have changed over a period of time.

Conclusion:

Hygiene measures related to COVID 19 were followed correctly by more than 50% of study cohort however few individuals were able to answer knowledge related questions correctly. Simple hygiene practices like face hygiene, cough etiquettes, social distancing, strict following of lockdown and having seen or read information on hand washing were predictors of COVID-19 infection. The study highlights the need for quick and rigorous attempts to educate people during a state of a health emergency.

Declaration:

References:

1. Andrews MA, Areekal B, Rajesh KR, Krishnan J, Suryakala R, Krishnan B, et al. First confirmed case of COVID-19 infection in India: A case report. Indian Journal of Medical Research. 2020 May 1;151(5):490

2. COVID-19: Govt bans all international flights to India from March 22 to 29 | India News - Times of India [Internet]. Available from: https://timesofindia.indiatimes.com/india/govt-bans-all-international-flights-to-india-from-march-22-to-29/articleshow/74720923.cms [cited 2021 Aug 19].

3. Kasturba : Mumbai's first line of defence - Times of India [Internet]. The Times of India. Available from: https://timesofindia. indiatimes.com/india/kasturba-hospital-mumbais-ground-zero/articleshow/81247648.cms [cited 2021 Aug 19].

4. Rozenfeld, Y., Beam, J., Maier, H., Haggerson, W., Boudreau, K., Carlson, J., &Medows, R. A model of disparities: Risk factors associated with COVID-19 infection. International Journal for Equity in Health. 2020;19(1), 126.

5. Acharyya A, Ghosh S, Ghosh M, Sarkar K, Ghosh S, Bhattacharya A, et al. Knowledge, attitudes, and practices towards COVID-19 among hospital staff of West Bengal during COVID-19 outbreak: A hospital based cross sectional study. Asian Journal of Medical Sciences. 2020;11(6):1–8.

6. Srivastava A, Bala R, Shil R, Shaw P, Karso L, Bhaumik H, Tamang S et al. Knowledge, attitude, practice, and perception towards COVID-19 in North Eastern states of India: An online cross sectional study. Asian Journal of Pharmaceutical and Clinical Research (2020);13(12):165-172.

7. Gupta P, Gupta A, Dixit S, Kumar H. Knowledge, attitude, and practices regarding COVID-19: A cross-sectional study among rural population in a northern Indian District. J Family Med Prim Care. 2020 Sep 30;9(9):4769-4773.

8. Narayana G, Pradeepkumar B, Ramaiah JD, Jayasree T, Yadav DL, Kumar BK. Knowledge, Perception, and Practices Towards COVID-19 Pandemic Among General Public of India: A Cross-Sectional Online Survey. Curr Med Res Pract. 2020;10(4):153–9.

9. Susilkumar, V., and S. Vengadassalapathy. "Knowledge, attitudes, practices and psychological response towards COVID-19 pandemic among general public in India." International Journal of Research in Pharmaceutical Sciences(2020): 892-900.

INSTRUCTIONS FOR AUTHORS

"Healthline" is a quarterly published national journal of Indian Association of Preventive and Social Medicine. "Healthline" aims to promote quality research in the field of Community Medicine and Public health. The editorial board of the journal is committed to an unbiased, independent, anonymous and confidential review of submitted articles. Manuscripts submitted to this Journal, should not have been published or under consideration for publication in any substantial form in any other publication, professional or lay. All the manuscripts once submitted to and published in the Healthline will become the property of the journal.

Aims and Objectives of the Journal:

The "Healthline" journal aims at promotion of high quality medical research by

- Ensuring the accessibility to novel ideas, observations and advanced knowledge for all by adopting open access policy
- Providing a platform to researches in Community Medicine and Public Health
- Improving the visibility of public health issues for concerned stake holders

Process for submission:

Authors are requested to strictly follow the guidelines provided herewith, while preparing the manuscripts for submission to the "Healthline" journal.

Editorial and Peer Review Policy:

The "Heathline" journal follows double blind peer review process. Following receipt of a manuscript from the authors, the manuscript undergoes an editorial review (by editor in chief/executive editor/joint editor). If the manuscript is found appropriate for the further process following the editorial review, the blind manuscript is sent to two anonymous peer reviewers and one statistical reviewer. It is ensured that the reviewers are having qualifications of post-graduation or higher in the concerned subjects and not from the same institute where the authors belong. Upon completion of peer review, the changes suggested by the reviewers are forwarded to the authors and modifications are sought with explanations (if required). The revised manuscript is again forwarded to the concerned reviewers. If the reviewers are satisfied with the revisions from the authors, the manuscript is accepted and formative changes are done for the publication. At any stage of review, if editorial board members or reviewers find the manuscript unsuitable for the publication, the manuscript is rejected.

General Instructions:

The manuscript can be submitted through email to editorhealthline@gmail.com. The email should contain separate document of Title Page and Original Manuscript both in MS Word as well as Copyright form (duly signed by all the authors), in jpg format. Authors are requested to prepare the article typed in "Times New Roman" fonts with size of "12". Double spacing (including references), should be followed with wide margins. There is no need to send a hard copy.

For any query, kindly reach editorial office through e mail at editorhealthline@gmail.com.

Preparation of Manuscript

Following are the word limits to be followed while submitting an article.

Type of Article	Maximum Word Limit
Editorial (by invitation only)	1500
Continuing Medical Education /Review article	4500
Original article *	3000
Short article	1500
Letter to Editor	750
Book review (should not be sponsored by any company/organization)	500

*Excluding abstract, references, tables and images

Manuscript should be prepared using American English language. Articles exceeding the word limit for a particular category of manuscript would not be processed further. Uniform Requirements for Manuscripts (URM) submitted to Biomedical Journals should be consulted before submission of manuscript (http://www.icmje.org).

Ethical Issues:

All articles should mention how human and animal ethical aspect of the study was addressed. Mention whether informed consent was taken or not. Identifying details should be omitted if they are not essential. When reporting experiment on human subjects, authors should indicate whether the procedures followed were in accordance with the Helsinki Declaration of 1975, as revised in 2000. (http://www.wma.net).

Title page:

This should contain the title of the manuscript, name and designation of all the authors, a short title (not more than 40 letters) to be used as the running title, source of support in the form of grants, equipments, drugs etc., acknowledgement, the institution where the work has been carried out and the address with contact number and email ID of the corresponding author. Briefly mention contribution of each author in multi author article.

Original Manuscript:

Each of the following sections should begin on a separate page. Number all pages in sequence.

Abstract:

Abstract should be a structured condensation of the work not exceeding 250 words for original research articles and 150 words for short communication. It should be structured under the following headings: Introduction, Objectives, Methods, Results, Conclusions, and 3- 5 Key Words to index the subject matter of the article. Please do not make any other heading.

Manuscript:

It must be concise and should include title, Introduction, Material and Methods, Result, Discussion, Conclusion, Recommendations and References. The manuscript should not contain names or any other information related to authors. The matter must be written in a manner, which is easy to understand, and should be restricted to the topic being presented. Insert tables and figures within the text at appropriate places. Written permissions of persons/agency acknowledged should be provided, if applicable.

Conflict of interest and financial support:

The situations where conflict of interest arises are when an author (or the author's institution), reviewer, or editor has financial or personal relationships that inappropriately influence (bias) his or her actions (such relationships are also known as dual commitments, competing interests, or competing loyalties). The potential of influences can vary from the insignificant ones to the significant ones where the results of the reviews or publication process. The conflict of interest can also occur if an individual believes that the relationship affects his or her scientific judgment. Financial relationships (such as employment, consultancies, stock ownership, honoraria, paid expert testimony) are also one of the identifiable conflicts of interest and the most likely to undermine the credibility of the journal, the authors, and of science itself. The other potential conflicts can occur for other reasons, such as academic rivalry, personal relationships and intellectual desire. (Source: International Committee of Medical Journal Editors ("Uniform Requirements for Manuscripts Submitted to Biomedical Journals"), February 2006) A brief statement on source of funding and conflict of interest should be included in the manuscript.

Published Statement of Informed Consent:

The involvement of study participants should be voluntary and following informed consent. Any details disclosing identification of the patients (names, record numbers, contact details, photographs and pedigree) must not be included in the published article. In case, such information is necessary for scientific reasons, an informed consent must be obtained from the study participants or parents/guardian (in case of children less than 18 years of age). Informed consent for this purpose requires that a patient who is identifiable be shown

the manuscript to be published. Authors should identify individuals who provide writing assistance and disclose the funding source for this assistance. Identifying details should be omitted if they are not essential. Complete anonymity is difficult to achieve, however, and informed consent should be obtained if there is any doubt. If identifying characteristics are altered to protect anonymity, authors should provide assurance that alterations do not distort scientific meaning and editors should so note. When informed consent has been obtained it should be indicated in the published article. (Source: International Committee of Medical Journal Editors ("Uniform Requirements for Manuscripts Submitted to Biomedical Journals"), February 2006)

Data Sharing Policy:

The authors must submit a statement of data sharing that, the data pertaining to original articles, published in "Healthline" journal must be provided, without restrictions, whenever asked for by the editorial board of the journal. Failure to comply this condition may lead to rejection of the article.

References:

In citing other work, only reference consulted in original should be included. If it is against citation by others, this should be so stated. Signed permission is required for use of data from persons cited in personal communication. ANSI standard style adapted by the National Library of Medicine (NLM) should be followed. Consult http://www.nlm.nih.gov /bsd/uniform_requirements.html. References should be numbered and listed consecutively in the order in which they are first cited in the text and should be identified in the text, tables and legends by Arabic numerals as **superscripts in square brackets (as example shown below)**. The full list of reference at the end of the paper should include; names and initials of all authors up to six (if more than 6, only the first 6 are given followed by et al.); the title of the paper, the journal title abbreviation according to the style of Index Medicus (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?d b=journals), year of publication; volume number; first and last page numbers. Reference of books

should give the names and initials of the authors, book title, place of publication, publisher and year; those with multiple authors should also include the chapter title, first and last page numbers and names and initials of editors. For citing website references, give the complete URL of the website, followed by date of accession of the website. Quote such references as - author name, title of the article, the website address, and date of accession.

Citation: 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.[4]

Journals: Mehta MN, Mehta NJ. Serum lipids and ABO Blood group in cord blood of neonates. Indian J Pediatr.1984; 51:39-43.

Book: Smith GDL. Chronic ear disease. Edinburgh: Churchill Livingstone; 1980.

Chapter in the Book: Malhotra KC. Medicogenetics. problems of Indian tribes. In: Verma IC, editor. Medical genetics in India.vol. 2. Pondicherry: Auroma Entrprises; 1978. p. 51-55.

Papers accepted but not yet published should be included in the references followed by 'in press". Those in preparation, personal communications and unpublished observations should be referred to as such in the text only.

Illustrations (Maximum 4):

These should be of the highest quality, **preferably black and white and editable**. Graphs should be drawn by the artist or prepared using standard computer software. Number all illustrations with Arabic numerals (1, 2, 3....).

Legends:

A descriptive legend must accompany each illustration and must define all abbreviations used therein.

Tables (Maximum 4):

These must be self–explanatory and must not duplicate information in the text. Each table must have a title and should be numbered with Arabic numerals. Each table should be typed in double space in results' section. All tables should be cited in the text.

Abbreviation:

As there are no universally accepted abbreviations, authors should use familiar ones and should define them when used first in the text.

Manuscript Processing Charges:

The manuscript processing charges are applicable to the publications in "Healthline" journal, as mentioned below, with effect from 1st issue of volume 12 of Healthline Journal.

- **First author – IAPSM Member: Rs 2500**
- **First author – Non-IAPSM Member: Rs 3500**

(Applicable for Letter to Editor, Original Article, Review Article, Short Communication & Book review)

The charges as mentioned above can be paid by cheque / online transfer in favour of below mentioned account.

Name of Account :	HEALTHLINE IAPSMGC
Account Number :	34898725422
IFSC Code :	SBIN0003043
Address :	State Bank of India, Civil Hospital Precincts Branch, Opp. B. J. Medical College, PO Bag No. 1, Ahmedabad-380016
MICR Code :	380002011

Following online payment of charges, the receipt of fund transfer should be emailed to editorhealthline@gmail.com.

If paid by cheque, duly prepared cheque should be sent to **Dr. K. N. Sonaliya, Editor in chief, Community Medicine Department, GCS Medical College, Opp. DRM Office, Nr. Chamunda Bridge, Naroda Road, Ahmedabad-380025, Gujarat, India.**

Advertisement Policy:

Being a national journal of Indian Association of Preventive and Social Medicine, "Healthline" has a reach to more than 4200 members of IAPSM, government health officials, Post Graduate students, epidemiologists, medical institutions and medical faculties across the country. It can provide a highly cost effective mode of advertising and passing the desired message to the targeted population.

"Healthline" provides the option of print advertisement on the pages of the printed issues of the journal. The rates for the same are as below.

Advertisement Type	Charges (INR) per Issue
Outer Back Cover (Full Page) Colour	25000
Inner Back Cover (Full Page) Colour	10000
Inner Back Cover (Half Page) Colour	7500

For advertisement or any query, please contact,

Editor in Chief, "Healthline" journal, Professor & Head, Community Medicine Department, GCS Medical College, Opp. DRM Office, Naroda Road, Ahmedabad-380025

Email: editorhealthline@gmail.com, Contact no.: +917966048351

COPYRIGHT FORM

Undertaking by Authors

We, the undersigned, give an undertaking to the following effect with regard to our manuscript entitled_____
_____"submitted for publication in Healthline journal :

1. The manuscript mentioned above has not been published or submitted to or accepted for publication in any form, in any other journal.

2. We also vouchsafe that the authorship of this manuscript will not be contested by anyone whose name(s) is/are not listed by us here.

3. I/We declare that I/We contributed significantly towards the research study i.e., (a) conception, design and/or analysis and interpretation of data and to (b) drafting the manuscript or revising it critically for important intellectual content and on (c) final approval of the ver sion to be published.

4. I/We hereby acknowledge the "Healthline" journal - conflict of interest policy requirement to carefully avoid direct and indirect conflicts of interest and, accordingly, hereby agree to promptly inform the editor or editor's designee of any business, commercial, or other proprietary support, relationships, or interests that I/We may have which relate directly or indirectly to the subject of the work.

5. I/We solemnly declare that the data pertaining to original manuscript, published in "Healthline" journal shall be provided, without restrictions, whenever asked for by the editorial board of the journal.

6. I/We also agree to the authorship of the manuscript in the following sequence:-

Name of author	Signature with Date	Mobile Numberr
1._____	_____	_____
2._____	_____	_____
3._____	_____	_____
4._____	_____	_____
5._____	_____	_____
6._____	_____	_____

Scanned copy of completed and duly signed declaration form should be emailed to the Editor/Publisher at **editorhealthline@gmail.com.**

The editorial board is highly obliged to the following reviewers for their kind co-operation in review of manuscripts published in Volume 13 Issue 1,2,3 & 4 of ''Healthline Journal''

Niramay Charitable Trust, Gujarat

"The best way to find yourself is to lose yourself in service of others" …

Mahatma Gandhi

Niramay 1: PEHEL Smart Anganwadis
Niramay 2: Facility Based SAM Treatment
Niramay 3: COVID Care Center – Ahmedabad
Niramay 4: Community Engangement

About us:

Niramay Trust is established by a group of public health professionals in year 2018 with an aim of improving health and well-being of people at large. Niramay works in areas major public health concern such as Cancers, Non-Communicable Disease, RMNCH+A with special focus on Malnutrition. We are also working towards evidence generation for helping evidence based public policy development. Niramay has touched lives of more than 15,000 people through various initiatives of organization. Brief of our activities is as follows:

- **Niramay Nutrition Interventions:** We have established two Bal Poshan Kendra at Jam Khambhalia (20 bed) and Hajipur, Gandhinagar (15 bed). We have screened more than 9,000 children in last one year and treated 250 SAM children identified.
- **Healthy Hundred Thousand Initiative (HHTI):** HHTI is community level NCD screening program. We have screened >5000 individual for diabetes, hypertension & oral cancer.
- **Smart Anganwadi in Gandhinagar Taluka.** Supported development of 5 Smart Anganwadis in Kalol Taluka,
- **COVID Response:**
  o **Comprehensive Health Screening for Police Personnel:** Screened 1441 police personnel during COVID times.
  o **Covid Care Center - Ahmedabad :** Provided free treatment to COVID Positive patients during second wave of COVID.
  o **COVID Response:** Technical Support to health dept, Facility preparedness assessment, provision of mask & sanitizers and development of informative video on Mucormycosis in Gujarati.
- **Mental Health Self-Assessment application:** Developed self-assessment application for depression & stress. This application is in Gujarati and available on play store as ***Niramayam.***
- **Project Mavtar.** We screened and provided health treatment to more than 700 elderly people living in 15 old age homes across Ahmedabad and Gandhinagar District.

Niramay belongs to all of us:

Niramay envisages to be a platform for experimenting newer public health ideas for greater good of the society. You can help as many people as possible by one of the following ways.

- **Project development and implementation**: you can help in developing newer ideas for improving service delivery at community. We can jointly work towards implementing projects collaboratively.
- **Research / Evidence generation**: We generate lot of data through our various programs. We look for support from you to help us standardize/analyze/publish data for supporting evidence-based policy development.
- **Connect with Givers**: Society has primary responsibility of taking care of the most vulnerable groups. We request you to connect us with philanthropists/donors for our activities. You can also consider donating to Niramay. Niramay trust has 80G registration and donations are exempt from income tax as per the IT regulations.

Contact us:

Niramay Charitable Trust.

A-303, Devnandan Summit, Sargasan, Gandhinagar. 382421

M: 9727763862, 9925360081

@: niramaygujarat@gmail.com

INDEX