A National Journal of Indian Association of Preventive and Social Medicine

HEALTHLINE

pISSN 2229-337X / eISSN 2320-1525

VOLUME : 12 ISSUE: 4 OCTOBER-DECEMBER - 2021

For more details visit : www.healthlinejournal.org

HEALTHLINE JOURNAL

A National Journal of

Indian Association of Preventive and Social Medicine managed by IAPSM-GC

Volume 12 Issue 4 (October-December 2021)

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Telemedicine: A Boon in COVID-19 Pandemic in India

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The COVID-19 pandemic has taken the world by storm, drastically affecting every aspect of life. It has become one of the causes of most unexpected number of deaths the world has seen since centuries. COVID-19 has introduced the world to a number of new things like lockdown, social distancing and the list goes on. Telemedicine is one of the terms, which existed since a long time but is made common by the COVID-19.

World Health Organisation defines 'Telemedicine' as 'The delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities.'[1]

First concept of Telemedicine was borne in 1924, when an American magazine, called RadioNews, foreshadowed telemedicine in depiction of an imaginative "Radio doctor" who was linked to patients not only by sound but also by a live picture. [2]

The first published accounts of telemedicine are dated back in the early 20th century when electrocardiogram data was transmitted over telephone wires.[1] Thereafter, a tele-radiology system was created in 1950s by a radiologist of a Canadian hospital. Medical uses of video communications in the United States are dated to 1959. In that year, clinicians at the University of Nebraska used two-way interactive television to transmit neurological examinations and other information across campus to medical students. [2]

NASA's telemedical technology has also played a vital role during earthquakes, first in Mexico City in 1985, and later in Soviet Armenia in 1988. [3]

Considering the vast geographical spread and huge population and limited resources of India, telemedicine can here be proved to be of special significance. Telemedicine Pilot Project launched by Indian Space Research Organisation (ISRO) in 2001 was the pioneer of telemedicine in India. This project led to linking of Chennai's Apollo Hospital with the Apollo Rural Hospital at Aragonda village of the Chittoor district in Andhra Pradesh.

This initiative of ISRO along with the establishment of National Telemedicine Task Force in 2005 by the Health ministry, paved the way for many other projects like Integrated Disease Surveillance Project (IDSP), National Cancer Network (ONCONET), National Rural Telemedicine Network, National Medical College Network and the Digital Medical Library Network.

Apart from attracting international projects like Pan-African eNetwork Project ,SAARC (South Asian Association for Regional Co-operation) Telemedicine Network Projects which gained Indian telemedicine its world renowned recognition, these efforts have also led to successful establishment of telemedicine

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Singh K. Telemedicine: A Boon in COVID-19 pandemic in India. Healthline. 2021; 12(4): 03-06.
	DOI : 10.51957/Healthline_322_2021	

facilities not only in Indian hospitals but also during massive Indian gatherings like Maha Kumbhamelas of Uttar Pradesh which use Mobile Telemedicine Systems to provide the health care to the people.[4]

The private sector with support of central and state governments has also been keen contributor for establishment of Telemedicine in India.

The continuous advancements in wireless broadband technology and the ever growing internet use are capable of making the telemedicine stress-free and cost effective. The modernisation of technologies and digitalisation of systems and improved infrastructures have facilitated sharing of real time audio and video, transfer of images and other medical data like X-rays and scans. To name a few; information storage databases, web service backups, standard formats for data transmission, encryption, password protection, Health Insurance Portability and Accountability Act of 1996 guidelines, digitalizing information, and establishment of electronic medical records ; are some contributions of modern telemedicine.[5] The most recent advancement in this field is "HEALTHSAT", which is an exclusive satellite, envisioned by ISRO for meeting the healthcare and medical education needs of the country at large. [6]

The COVID-19 pandemic has caused collapse of even the world's biggest and best health care systems. India is a country where doctor: population is 1:1511, while as recommended by WHO should be at least 1:1000.[7] According to Human Development Report, 2020; India caters 0.5 beds per 1000 population, which should be 5 per 1000 according to WHO.[8]

Government of India launched 'e-Sanjeevani OPD' on 13April 2020 in an effort to handle the COVID-19 pandemic and ensure smooth running of healthcare facilities and to provide health services to the patients in confinement of their homes.[9] E-Sanjeevani currently permits two types of telemedicine services: Doctor to Doctor (eSanjeevani) and Patient-to-Doctor (eSanjeevani OPD). As a part of Ayushman Bharat Health and Wellness Center, states have formed dedicated 'Hubs' in medical colleges and district hospitals to provide tele-consultation services to identified sub-centres, primary health centres and health and wellness centres, called as 'Spokes'. This is known as 'Hub and Spoke Model'. [10] Health ministry have recorded 1.4 crore consultations as on 18 October 2021. [11]

Government of India on 7 August 2020, released updated strategy of National Digital Health Mission (NDHM) which outlined the envisioned digital registries of doctors, hospitals, pharmacies and insurance companies, digital personal health records and digital clinical decision system. The NDHM is a complete digital health ecosystem which consists of five key components namely: Health ID, Personal Health Records, Digi Doctor or Doctors' Directory, Health facility registry, Electronic Medical Record website application. [10]

In the wake of COVID-19 pandemic, telemedicine has proved to be a boon both for health care professionals as well as the patients including their family and caretakers. Because of the facility of telemedicine for health care, follow ups, and triage of patients; the medical personnel and equipments were spared for more serious COVID-19 and non-COVID-19 patients leading to decrease in burden on the health care facilities. It helped medical professionals to still be supervising their patients, get second opinions from their peers, share experiences worldwide and arrange trainings and conferences.

Telemedicine also helped patients decrease travel expenditure, decrease medical costs, provided easier access in lockdown period and saved time by escaping long queues. It was especially beneficial for people with chronic diseases like diabetes mellitus, hypertension, thyroid diseases. These are the people who were on greater risk of COVID-19 and were provided with treatment adherence as well as refrained from manageable hospital visits. Telemedicine helped provide emotional and

psychological reassurance, a much needed thing especially in times of social distancing. It helped provide training not only to medical staff but also to the care providers of sick and disabled people especially children and elderly.

Telemedicine has helped to a great extent in infection control especially by minimizing movement of the masses thereby leading to confinement of infection to a particular area and protecting people from hospital acquired infections which acted as a core of infections. Thus, telemedicine can be used as a sword in the world's fight against COVID-19.

Until recently, there were no guidelines on the practice of telemedicine in India. To fill this gap of lack of legislation and ethical consideration, the Board of Governors of the Medical Council of India in partnership with NITI Aayog prepared 'Telemedicine Practice Guidelines' which was released by Ministry of Health and Family Welfare (MOHFW) on March 25, 2020.[12]

These guidelines are meant for Registered Medical Practitioners (RMPs) under the Indian Medical Council (IMC) Act, 1956. They cover norms and standards of the RMP so as to consult patients via telemedicine.

An outline program will be developed and made available by Board of Governors in supersession of MCI, which will be mandatory to be completed within 3 years of notification. Until then the principles mentioned in the guidelines need to be followed.

There are seven elements that need to be considered before telemedicine consultation : [12]

1. Context: Telemedicine should be appropriate and sufficient as per context.
2. Identification of RMP and Patient: An RMP should verify and confirm patient's identity by name, age, address, email ID, phone number or registered ID. An RMP should inform the patient about his name and qualifications and should display his registration number accorded by medical council.
3. Mode of Communication: Primarily there are 3 modes: Video, Audio or Text.
4. Consent: Patient consent is necessary. Consent is 'Implied', if the patient initiates the telemedicine consultation; and 'Explicit' when health worker, RMP or a caregiver initiates it.
5. Type of Consultation: They can be of two types: (i) First Consult – If he patient is consulting the RMP for the first time or after more than 6 months since the previous consultation or if the patient has consulted the RMP earlier, but for a different health condition (ii) Follow-Up Consult-If the patient is consulting the same RMP within 6 months of his previous in person consultation and this is for continuation of care of the same health condition.
6. Patient Evaluation: RMPs must make all efforts to gather sufficient medical information about the patient's condition before making any professional judgment. If a physical examination is critical information for consultation, he can recommend for either video consultation or examination by another RMP/ Health Worker or in-person consultation, and then proceed further.
7. Patient Management: If the condition can be appropriately managed via telemedicine, then the RMP may proceed to provide health education; and/or counselling; and/or prescribe medicines.

   The categories of medicines that can be prescribed (as notified by central government from time to time) are:

- List O: These are safe to be prescribed through any mode of tele-consultation. They comprise 'over the counter drugs' and also the medicines that may be deemed necessary during public health emergencies.
- List A: These medications are those which can be prescribed during the first consult which is a video consultation and are being re-prescribed in case of follow-up.

- List B: Is a list of medication which RMP can prescribe in a patient who is undergoing follow-up consultation in addition to those which have been prescribed during in-person consult for the same medical condition.
- Prohibited List: These medicines have a high potential of abuse and could harm the patient or the society at large if used improperly. It comprises medicines listed in Schedule X of Drug and Cosmetic Act and Rules or any Narcotic and Psychotropic substance listed in the Narcotic Drugs and Psychotropic Substances, Act, 1985.

Conclusion:

Although telemedicine cannot replace in-person consultations or emergency medicine, yet it is safe to say that it is a boon for the mankind. Telemedicine deserves much needed growth and implementation and requires to reach not only the most modernized but also the remotest and farthest of areas. The extension of telemedicine will help us handle COVID-19 pandemic and will put us together for the unseen future calamities.

Declaration:

Funding:Nil

Conflict of interest: Nil

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Facility Based Management of Child Malnutrition- Lesson Learnt From a North Gujarat Study

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Abstract:

Introduction: Malnutrition is a key health problem in India and Gujarat. Mission BalamSukham was launched to overcome malnutrition. Facility-based management of malnutrition is one of two components of this program. **Objectives:** 1. To evaluate Strengths, Weaknesses, Opportunities and Challenges (or Threats) of Child Malnutrition Treatment Centre (CMTC) and Nutrition Rehabilitation Centre (NRC). 2. To project into areas that needs improvement to overcome the centres' weaknesses and challenges. **Method:** In-depth interviews were taken for health workers and beneficiaries of NRC and CMTC of Patan district till saturation of responses. Transcripts were made and themes were analysed based on the SWOC matrix. **Results:** Major issues identified by the study were absence of continuous financial support to operationalize CMTCs selected under Gatishil Gujarat program, Absence of Paediatrician, lack of awareness regarding child nutrition over night stay at centre and quality of training. **Conclusion:** Some internal weaknesses and strengths were acknowledged. Only facility-based management of SAM children did not make a difference in community. Training of ASHA and Anganwadi worker about nutritional counselling, screening and monitoring of SAM child is needed to strengthen the community-based management of SAM children.

Keywords: Child Malnutrition Treatment Centre, Facility based management, Malnutrition, Nutrition Rehabilitation Centre

Introduction:

Malnutrition among under-five children is one of the key public health problems in India which is reflected by the fact that India is the topmost in the world with respect to the prevalence of under-weight children and the prevalence is nearly double that of Sub-Saharan Africa. It is also pragmatic that the malnutrition problem in India is a localized phenomenon that is, a relatively meager number of states, districts, and villages account for a significant share of the malnutrition burden; only five states and 50% of villages are responsible for about 80% of the malnutrition burden.[1] Prevalence of undernutrition among under-five children according to the National Family Health Survey 4 (NFHS-4) in India shows that 35.7% under-five children were underweight, 38.4% were stunted and 21% were wasted.[2] According to the National Family Health Survey 5 (NFHS-5), the prevalence of undernutrition among under-five children was 39.7% underweight, 39% stunted and 25.1% wasted in Gujarat.[3] Paucity of suitable food, lack of purchasing power of the family coupled with traditional beliefs and taboos often lead to an unsatisfactory balanced diet, resulting in malnutrition.[4]

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Solanki N, Sharma P, Ninama R. Facility Based Management of Child Malnutrition- Lesson Learnt From a North Gujarat Study. Healthline. 2021; 12(4):07-14.
	DOI : 10.51957/Healthline_277_2021	

To combat the problem of malnutrition, some states initiated high-level nutrition missions- such as Gujarat, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra and Uttar Pradesh.[5] In 2012, Gujarat State Nutrition Mission (GSNM) was launched by the Government of Gujarat,[6] wherein a network of rehabilitation centers across the state was recognized to provide therapeutic treatment to severely wasted children. Despite this, recent data suggest that Gujarat state still depicts one of the highest (9.5%) incidences of severe wasting.[7]

In Gujarat, Mission Balam Sukham was started to improve the nutritional status of the children.[8] There are two approaches for managing children under this Mission; Community Based management and Facility Based management. Gujarat has adopted 3 tier approach for management of malnutrition. Children having severe acute malnutrition (SAM) are provided 14 days of nutritional treatment therapy in groups of 10 children at CMTC. The success of this initiative and improvement of nutritional status largely depend upon the adequate functioning of the CMTC, including infrastructure, staff, fund allocation etc.

Objectives:

1. To evaluate Strengths, Weaknesses, Opportunities and Challenges (or Threats) of Child Malnutrition Treatment Centre (CMTC) and Nutrition Rehabilitation Centre (NRC).
2. To identify areas which need improvement so as to overcome weaknesses and challenges of the centre.

Method:

Qualitative Research study was conducted among stakeholders and beneficiaries from selected NRC and CMTC of Patan District of Gujarat. In-depth interview was coundcted Telephonically as well as one to one when it was feasible. Purposive sampling method was used to conduct interview till the saturation of responses is reached. Based on the operational guideline of CMTC, detailed Interview guides were prepared for Health care worker (staff nurses or Medical officers), Nutritionist and Mothers of the Beneficiaries to assess the functioning of the centres.

Six CMTCs and one NRC of Patan district were selected for the SWOC (Strengths, Weaknesses, Opportunities and Challenges) analysis of the centre; but the saturation of responses was reached after evaluating four CMTCs, so finally data was analysed from four CMTCs and one NRC. Ethical Approval was taken from Institutional Ethical Committee.

A full-day visit was conducted to understand the functioning of the selected CMTCs and NRC. All stakeholders of the centre, including the Health care providers, nutritionist and mothers of the beneficiaries etc. were personally interviewed to collect the desired information. After the field visit, all information thus collected was transcribed and translated using suitable themes and codes and further analysed to prepare a SWOC matrix.

Results:

SWOC Analysis

The study was carried out to assess the strengths, weaknesses, opportunities and challenges of government NRC and CMTC functional in Patan District. Total of 19 participants were interviewed by using a qualitative interview guide. Ten were healthcare providers and nine were mothers of admitted SAM children were interviewed.

STRENGTHS

Policy and Guidelines : Most of the centers follow CMTC and NRC guidelines of the government of Gujarat for admission and discharge of SAM children. Almost all centers had received updated information of any change in guideline. All stakeholders had good knowledge regarding the programmatic guidelines (criteria for admission, discharge and follow-up).

Table 1: Area of interest in SWOC matrix

Strength (S)	Weakness (W)	Opportunity (O)	Challenges (C)
• Staff Worked according to guideline. • Knowledgeable and Motivation staff. • Physical Infrastructure. • Human Resources (HR) in Place • Funds management • Mobility Support for beneficiary	• Training. • Availability of specialist in all CMTC centre • Referral to higher centres • Availability of Vegetables and Fruits • Supportive Supervision visit not done.	• Mobilization of other fund resources • F-IMNCI training for Staff Nurses at CMCT/NRC	• Ignorant behavior of mother about malnutrition status of their children. • Beneficiary refuses to stay in night at center. • Reluctant for admission in center for treatment. • Inadequate counselling by Acredited Social Health Activist (ASHA) Anganwadi Worker (AWW)

Table 2: List of Participants of Patan district

Sr. No	Center	Interviews	Nutritionist	Health care worker (Staff Nurse or Medical officer)	Beneficiary
1	NRC- Dharpur	4	1	1	2
2	CMTC- Chanasma	4	1	1	2
3	CMTC- Sariyad	4	1	1	2
4	CMTC- Harij	4	1	1	2
5	CMTC- Shankheswar	3	1	1	1
Total		19	5	5	9

Table 3: Characteristics of the participants

Respondents	Demographic variables	Category	Frequency
Healthcare worker	Age (in years)	Less than 30	7
		More than 30	3
	Experience (in years)	Less than 2	6
		More than 2	4
Mothers of Beneficiaries	Age (in years)	Less than 30	5
		More than 30	4
	Gender	Male	0
		Female	9

Table 4: Perceived barrier and possible solution as suggested by responders

Responder	Perceived barrier	Enablers
Health Care worker	Issues of funds in Gatishil Gujarat run CMTC	Common fund allocation to all CMCT
	Ignorant behavior of mother about child condition	Counseling by ASHA and ANM at Mamta diwas
	Overnight stay at a facility	Food packets
	Lower education and socioeconomic status of a mother	Received incentive
	Inadequate monitoring	Plan session for supportive supervision
	None availability of a pediatrician	F-IMNCI Training plan for MO and Staff nurses/ PPP model also adopted to enrollment of pediatrician
	Referral issues	Collaborative approach for the development of strong reference network
Beneficiary	Night stay issues	Demand generation regarding the services
	Unawareness of health importance	Positive counselling at time of Mamtadiwas
	14 days stay is not possible	IEC activity at Community level for community Engagement

SWOC Matrix analysis

SWOC	**Strength (S)** • Worked according to guideline. • Knowledgeable and Motivated staff. • Good Infrastructure. • All HR in Place • Funds management good in CMCT and NRC run by NHM • Mobility Support for beneficiary was good.	**Weakness (W)** • Refresher Training should be organized. • Non availability of pediatrician in ALL CMCTC center • Referral issues from PHC. • Lack of Vegetables and Fruits serve in NRC • Supportive Supervision visit not done.
Opportunity (O) • RKS fund utilization • Positive experience sharing by beneficiaries to others. • Supportive supervision. • F-IMNCI training for Staff Nurses at CMCT/NRC • All CMTC run under common fund NHM	**SO Strategies** • Some untied funds should be put in budgets to purchase the fruits and vegetables as on daily based bills was not generated. • Policy and guidelines should be reframed to use funds from NHM RKS funds are utilized for improving the services.	**WO Strategies** • Planning of Positive experience sharing by beneficiaries at MAMTA DIWAS. • Training of staff should be there in regular intervals. • Pediatrician enrolled in PPP model. • Staff nurse and MO trained in F-IMNCI • Supportive supervision visits are to bemade compulsory.

Challenges (C)	SC Strategies	WC Strategies
• Ignorant behavior of mothers about malnutrition status of their children. • Beneficiary refuses to stay atnight at the center. • Reluctant for admission in center for treatment. • Inadequate counseling by ASHA/AWW	• Nutrition education program run at village level. • Screening of children for malnutrition at the Village level. • Training of ASHS/AWW for nutrition counseling.	• Night stay refusal issues overcome by prescribing diet plan to be followed at home according to guidelines for enrolled children. • In case of complications when a pediatrician is needed, a child can be referred with transport facility to NRC.

Human resource: Most of the centers had all staff as per the guideline. No vacancy has occurred since the last two years in all centers.

Finance: Fund allocation was observed differently in CMTC. Some CMTCs and NRCs received funds from NHM, whereas some CMTCs received funds from Gatishil Gujarat Scheme.

Infrastructure: All CMTC and NRC had good infrastructure with adequate floor space for ten beds, kitchen, counseling room, nutritionist room, and bathroom and storeroom. All centers were keeping good cleanliness in wards, kitchen and bathrooms. The quality of food given was good.

"Rooms, toilets and washbasin is cleaned" Beneficiary, 26 years, Female)

Positive feedback regarding stay in almost all CMTC.

"Toilets and kitchen were maintained good cleaning. They were mopped twice daily and also clean toilet two times a day"(Beneficiary, 24 years, Female)

"24 hours drinking water facilities were available at center"(Beneficiary, 29 years, Female)

Support from other Hospital staff

Almost all centers had get good support from other staff of the hospital.

"Hospital clerk helped us for account and also transfer of money to different beneficiary account, other hospital staff also help in maintain the center". (Health care worker 32 years, Female)

Mobility support : All centers had mobility support in KHILKHILAHAT VAN for to and fro movement between beneficiary's home and the health center. Average 8 to 10 gm/kg/day weight gained was observed in all centers. NRC was awarded for the maximum number of SAM and MAM admission in 2018.

WEAKNESSES

Bottlenecks of Budget : All CMTC run under the Banner of Gatishil were faced financial crisis from time to time. Staff did not get timely salary and funds for food at the Centers.

"Sometimes, we received grants 4 to 5 months back. It's very difficult to sustain the center in this situation. We did not get salary. It also broke down our enthusiasm towards our work'' (Health Care Worker (HCW) 26 years, Female)

"Sometimes, we also put our money for purchasing food for children" (HCW, 35 years, Female)

"We did not purchase fresh vegetables, and fruits as the local vendor did not provide bills for the same. So child did not get fruits, and fresh vegetables for eat"". (Beneficiary, 26 years, Female)

Capacity building: Most healthcare providers took training two to three years back and there was no refresher training.

"Due to COVID-19 there was no training organized from last two years and so we did not take it" "(HCW 28 year, Female). Lack of training of grass root level workers was observed for counseling skills.

Non-availability of a pediatrician at CMTC: No pediatrician was available at any CMTCs. In NRC, the pediatrician was only visiting once a day.

"Pediatrician does not visit the NRC for management of child, so NRC staff has to take child to OPD or word for consultation of pediatrician. We also sit in pediatric Out Patient Department or screening of SAM child"(HCW of NRC, 28 years, Female)

Almost all CMTC refer the child with complications to NRC due to the non-availability of pediatrician. "Sometimes we admit in the child, but they did not respond the treatment and did not gain proper weight, so we refer them to NRC, which further lead to delay in treatment"(HCW of NRC, 28 years, Female)

Proper referral from PHC and other centers: Some Primary health centers were not transferring the malnourished children to CMTC and NRC. Instead, only one or two children were referred to CMTC and NRC. So facility based screening and referral was not good. Only one or two child were referred from PHC to CMTC/NRC per month.

Lack of protective foods (vegetables and fruits) at NRC : The main reason was that neither bills nor vouchers for purchasing these foods were allowed for disbursement of funds leading to the non-availability of fresh fruits and vegetables for the beneficiaries.

Supportive Supervision: None of the supervisory health officers visited NRC/ CMTCs for supportive supervision for two years due to the COVID-19 pandemic.

OPPORTUNITIES

Rogi Kalyan Samiti(RKS) funds: Untied fund of Rogikalyan Samiti might be utilized where there is a lack of funds especially the CMTC under the Gatishil Gujarat. All CMTCs may have a shared fund pool from NHM.

Capacity building: Training of Aganwadi worker, ASHA and ANM for counseling regarding the continuous stay at NRC/ CMTC for 24x7. Positive experience shared by mother who stay at CMTC and NRC to other beneficiaries done in Mamta diwas.

Monitoring and supervision

Regular supportive supervision by concerned health officers for identification and solution of different issues of center.

F-IMNCI training: None of the staff was trained in facility based management of neonatal and childhood illness. In-charge Medical officers and staff nurses should be trained in F-IMNCI.

CHALLENGES

Not reaching the facilities: Some of the beneficiaries were not willing to stay overnight for a longer period of 14 days. ASHA and AWW do not have adequate counseling and communication skills.

Beneficiaries were not wanted to be admitted in NRC because of fear of corona infection as NRC is situated near theCOVID-19 designated hospital.

Night stay at CMTC and NRC:

None of the beneficiaries were staying in night due reasons like

1. Taking care of other children at home
2. Refusal by in-laws and husbands
3. Household works and works in fields and in farms

"We have cattle at home and also household work, if we stay here in night all work was suffered a lot. My husband was also alone at home. No one was

there for preparing the food. So we cannot stay at night"(Beneficiary 9, 29 years, Female)

"I have two more child at home and in laws also. I have to take care of them too. I have to prepare food at home. So, not possible to stay at home"(Beneficiary 8, 34 years, Female)

Absent of counseling by grassroots level workers. : Mothers were not counseled on correct cooking practices, low-cost recipes, Energy Protein Dense-EPD diet, hand hygiene and child care at home.

Ignorance of mother about the Malnutrition status of their child : Some mothers were not aware about malnutrition status of their child and health consequence. Such mothers were visiting to CMTC/NRC only for foods and incentives. At some center mothers by mothers who were taught to prepare the low cost food by nutritionist were not able to recall the process at the time of interview. "Yes, the nutritionist was teaching us how to prepare food, but I did not recall it now. I also 'don't understand some part of it (Beneficiary, 26 years, Female)

Discussion:

Malnutrition was significant health issue in India. To overcome this government had operationalized CMTC and NRC for the treatment of malnutrition. The present study was planned toevaluate Strengths, Weaknesses, Opportunities and Challenges (or Threats) of the Child Malnutrition Treatment Centre (CMTC) and Nutrition Rehabilitation Centre (NRC). All centers had good infrastructures, knowledgeable human resources, and good support from other departments. Though there was good infrastructure and cleanliness, beneficiaries refused to stay in the night because of family issues and other household jobs. In some centre they missed the evening feeds. A similar finding was observed in Patel MP et al. study of south Gujarat. Another major issue was the non-availability of a paediatrician at CMTC. An integrated approach for management of SAM child at centre is very important in such set up. Staff nurse and Medical officer must be trained for F-IMNCI to better manage SAM child and its complication.

Ignorant behaviour of mother about nutritional status of children and this was also observed in Tejana G et al study in Madhya Pradesh. Mothers are stayed at the centers so that they can be taught and educate for effective care of the children and the preparation of the low cost diets from locally available material. Surprisingly, this fact was ignored at the centers and much attention was paid to the improvement in nutritional status of the children, which is essentially considered to be the criteria of the program's success.[14]

For sustained benefits and prevent relapse, implementation of CMAM programme was very crucial as single time management of SAM child at facility level may not be a bearable strategy. In our study, we found all beneficiaries were from low socio-economical classes. For them, if services avail at their doorstep was very important, and most literature on the subject implies that the long-term effectiveness of the NRC is affected by limiting factors at home and in the center itself.[12,13] Regular follow-up visits of all discharged children done by the ASHA and AWW.

Conclusion:

Internal weaknesses and strengths were acknowledged by the study. Only facility-based management of SAM children did not make a difference in community. Training of ASHA and Anganwadi worker about nutritional counselling, screening and monitoring of SAM child is needed to strengthen the community-based management of SAM children.

Declaration:

Funding: State Health Systems Resource Center, Gujarat

Conflict of Interest: Nil

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Evaluation of Growth Progress among Malnourished Children Attending Village Child Nutrition Centre (VCNC) Under Mission Balam Sukham at Ahmedabad District, Gujarat

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Abstract:

Introduction: Government of Gujarat launched "Mission Balam Sukham" in the year 2012 to combat the malnutrition with three tier approach. At village level Village Child Nutrition Center (VCNC) runs at Anganwadi centers where children with Severe Acute Malnutrition (SAM) and Moderate Acute Malnutrition (MAM) children aged 6 months to 6 years without any medical complications are enrolled for 30 days and provided with the nutrition supplements as per standard protocol including micronutrients. **Objectives:** To study the growth progress among malnourished children after one month of intervention at VCNC. **Method:** A cross sectional study was conducted over one year period in selected VCNCs of Ahmedabad District. All the malnourished children admitted to these selected VCNCs during study period were included in the study. Data on weight status at admission and discharge, rate of weight gain, grade of malnutrition at entry and exit were collected from the records and analyzed using statistical software. **Results:** A total of 934 malnourished children were included in the study. A statistically significant difference was observed for weight at discharge (11.1 ± 2.07kg) and weight at admission (9.92 ± 1.77kg) for all the children. About 8.7 % children in urban and 16.5 % in rural area achieved the recommended weight gain of 5 grams/kg/day and the difference was statistically significant. In urban and rural area children who achieved the target (>15%) weight gain was 6.3% and 14.7%, respectively and this difference was statistically significant. **Conclusion:** In the current study, 7.3% children achieved the target (>15%) weight gain. Suggesting that VCNC supplementation for 1 month was not found adequate to give desired result.

Keywords: Malnutrition, Mission BalamSukham, Nutritional Intervention, Village Child Nutrition Center

Introduction:

Adequate nutrition is essential in early childhood to ensure healthy growth, proper organ formation and function, a strong immune system, and neurological, psychosocial and cognitive development.[1]

Malnutrition is both undernutrition and over-nutrition ranging from severe nutrient deficiencies to extreme obesity.[2] Undernourished children have significantly higher risk of infections which lead to higher morbidity and mortality. Children suffering from Severe Acute Malnutrition (SAM) are 9 times more likely to be died than well nourished children.[3] An inappropriate feeding practice is still believed to account for at least one-third of causes of malnutrition, and contributes significantly to morbidity and mortality, among children under five.[4]

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Prajapati B, Shukla A. Evaluation of Growth Progress among Malnourished Children Attending Village Child Nutrition Centre (VCNC) Under Mission Balam Sukham at Ahmedabad District, Gujarat. Healthline. 2021; 12(4): 15-19.
	DOI : 10.51957/Healthline_266_2021	

Each year approximately 2.3 million deaths among 6-60 months aged children in developing countries are associated with malnutrition, which is about 41% of the total deaths in this age group.[5] More than half of all deaths before age five years in India are related to malnutrition. The National Family Health Survey-5 (NFHS-5) conducted during year of 2019-2020 showed that in Gujarat the prevalence of severe wasting is 10.6 percent among all children under-five years of age.[6] In of children under five years of age 39 percent are stunted and 39.7 percent are underweight.

Government of Gujarat has started "Mission Balam Sukham" to address and improve the nutritional status of the children.[7] There are two approaches for management of children under Mission Balam Sukham. First is Home or Community Based management and second one is Inpatient or Facility Based management. The integrated management of malnourished children is done through – 3 tier approach including Village Child Nutrition Center (VCNC), Child Malnutrition Treatment Center (CMTC), Nutrition Rehabilitation Center (NRC).[8]

At village level VCNC runs at anganwadi centers managed by Anganwadi Worker (AWW), Anganwadi Helper (AWH) and Accredited Social Health Activists (ASHA). Severe Acute Malnutrition (SAM) and Moderate Acute Malnutrition (MAM) children aged 6 months to 6 years without any medical complications are enrolled for 30 days. Nutrition supplements are given as per standard protocol including micro nutrients like Vitamin-A, Iron, folic acid and Zinc. Malnourished Children are provided 5 meals per day including 2 ICDS meals containing total 1000 kcal and 30 grams of proteins for 6 to 36 months age and 1270 kcal and 40 grams of proteins for 3-6 years of children. Parents of malnourished children are also counseled for home based care, health and sanitation.[9] This study has been taken up to evaluate the growth progress among malnourished children at these centers.

Method:

It was a Cross Sectional study conducted during the period from November 2016 to November 2017 in selected VCNCs of Ahmedabad District. All 80 VCNCs registered under urban and rural field practice area of community medicine department were selected for data collection. All the malnourished children within the age of 6 months to 6 years were included. Children above the age of 6 years or having any disease or complication were excluded from study. Total 934 malnourished children admitted to these selected VCNCs during study period were included. Data on weight status at admission and after one month of admission, rate of weight gain (acceptable weight gain is 15% or more from the baseline weight after one month of admission), grade of malnutrition at entry and exit were collected from the records. The Data collected was entered in Microsoft excel worksheet and analyzed using statistical software. The Z-score of anthropometric data was calculated using the new international reference population released by the WHO.[10] Chi-square test was used to assess the difference between the frequency distributions and t test was used to compare difference between the means. Ethical Clearance from Institutional Review Board of the Medical College has been obtained.

Results:

Total 934 malnourished children aged 6 months to 6 years from 80VCNCs were selected from both urban and rural area and their baseline data and follow up data was collected to evaluate growth progress. Growth progress among malnourished children was analyzed based on their age, sex and malnutrition grade.

With regards to age distribution majority of children (50.2%) were in age group of 37 to 60 months followed by 13 to 36 months' age group (46.6%) and 6 to 12 months' age group (3.2%). (Figure 1) Out of total children, 53.1% were girls and 46.9% were boys.

Figure 1: Age wise distribution of children (N=934)

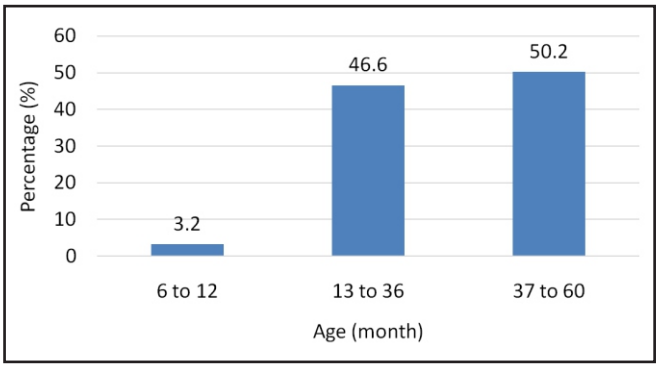

Table 1: Age, Gender and Malnutrition grade wise distribution of children (N=934)

YELLOW Classification			
Age (Months)	**Boys**	**Girls**	**Total**
6 - 12	10 (3%)	10 (2.8%)	20 (2.9%)
13 – 36	165 (50%)	157 (43.1%)	322(46.4%)
37 - 60	155 (47%)	197 (54.1%)	352 (50.7%)
Total	330 (100%)	364 (100%)	694 (100%)
RED Classification			
Age (Months)	**Boys**	**Girls**	**Total**
6 - 12	5 (4.6%)	5 (3.8%)	10 (4.2%)
13 – 36	52 (48.2%)	61 (46.2%)	113 (47.08%)
37 - 60	51 (47.2%)	66 (50%)	117 (48.75%)
Total	108 (100%)	132 (100%)	240 (100%)

Table 2: Mean weight of children at time of admission and discharge (N=934)

Gender	Weight at Admission (Mean ± SD)	Weight at Discharge (Mean ± SD)	p value (paired t test)
Boys(n=438)	9.98 ± 1.76	11.17 ± 2.15	< 0.0001
Girls(n=496)	9.87 ± 1.79	11.05 ± 2.0	< 0.0001
Total(n=934)	9.92 ± 1.77	11.1 ± 2.07	< 0.0001

Children whose weight for age Z-score is below the three standard deviations (<-3 SD) are considered in red classification and children whose weight for age Z-score is below -2 SD are considered in yellow classification according to WHO growth chart.[10] According to WHO growth standards,

Figure 2: Z-score for weight for age at admission and discharge (N=934)

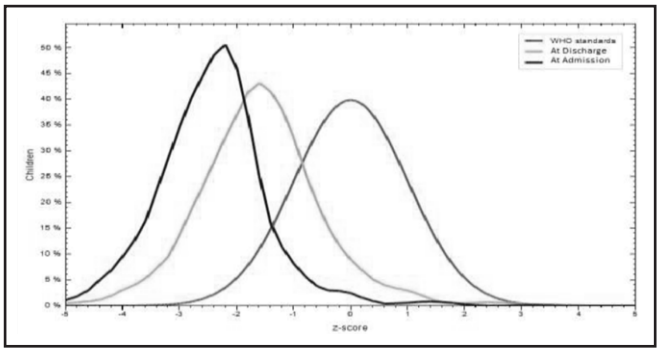

Table 3: Average weight gain (gm/kg/day) of the children (N= 934)

Area	Average weight gain (gm/kg/day)		
	Not Acceptable (<5 gm/kg/day)	Acceptable (≥5 gm/kg/day)	Total
Urban	753 (91.3%)	72 (8.7%)	825 (100%)
Rural	91 (83.5%)	18 (16.5%)	109 (100%)
Total	844 (90.4%)	90 (9.6%)	934 (100%)

Chi-square value = 5.83, df = 1, p value = 0.015

Table 4: Percentage of weight gain from base line among the children (N=934)

Area	Average weight gain (%)		
	Acceptable (≥15%)	Not Acceptable (<15%)	Total
Urban	52 (6.3%)	773 (93.7%)	825 (100%)
Rural	16 (14.7%)	93 (85.3%)	109 (100%)
Total	68 (7.3%)	866 (92.7%)	934 (100%)

Chi-square value = 8.8, df = 1, p value = 0.003

694(74.3%) children including 330 boys and 364 girls were in yellow classification and 240 (25.7%) children including 108 boys and 132 girls were in red classification. In both yellow and red category majority of children were in 37 to 60 month age group followed by 13 to 36 month and 6 to 12 month age group. (Table 1)

All children's baseline weight was compared with weight measured at the end of 1 month. An average weight gain was calculated and compared.

Table 2 shows mean weight of children at the time of admission and discharge. A statistically significant difference was observed for weight at discharge (11.1 ± 2.07) and weight at admission (9.92 ± 1.77) for all the children (t=31.24, p<0.0001). The observed difference of mean weight of 438 boys at the time of admission (9.98 ± 1.76 kg) and discharge (11.17 ± 2.15 kg) was statistically significant (t=33.47, p<0.0001). The difference of mean weight of 496 girls at the time of admission (9.87 ± 1.79 kg) and discharge (11.05 ± 2.0 kg) was statistically significant (t=33.44, p<0.0001). There was no obvious difference of weight gain between boys and girls.(Table 2)

VCNC performance indicators include average weight gain of minimum 5 gm/kg/day. Of the total 934 children, about 9.6% of children achieved the recommended weight gain of 5 g/kg/day, with the average weight gain being 7.89 ± 4.49 g/kg/day. Among them 8.7 % children in urban and 16.5 % in rural area achieved the recommended weight gain with the average weight gain being 7.33 ± 3.9 g/kg/day and 10.12 ± 5.96 g/kg/day respectively. The difference in weight gain between children in urban and rural area was statistically significant. (Table 3)

VCNC guideline has taken 15% or more weight gain from the baseline weight as significant weight gain among the malnourished children. At the end of every month, numbers of children were calculated who gained the 15% or more of baseline weight. Out of total 934 children, only 7.3% children achieved the target (>15%) weight gain. In urban and rural area children who achieved the target (>15%) weight gain was 6.3% and 14.7%, respectively and this difference was statistically significant.(Table 4)

Z-score for weight for age criteria was calculated using WHO anthro software. An average difference in Z-score for weight for age was calculated and compared at the end of month. As shown Figure 2, there was Z-score increment among children was observed after one month.

Discussion:

Demographic data showed a share of girls (53%) in children admitted to the program and half of the children admitted into the program were less than 3 years of age. Similar findings were observed by Pandya VP et al.[11] This has major public health implications for the prevention and reversal of acute malnutrition and also suggests that active case-detection strategies may benefit from focusing on this age group. In this study, 7.3% of children who completed the treatment were cured. Cured rate in studies done by Pandya VP et al[11] was in the acceptable range but in ours and other study by Zalavadiya et al.[12] it was below the acceptable range.

A review study involving thirty-three studies of community-based rehabilitation for malnourished children were examined and summarized concluded that eleven (33%) programs were considered effective. Effectiveness was defined as mortality of less than 5% and an average weight gain of at least 5 g/kg/day. High energy intakes (> 150 kcal/kg/day), high protein intakes (4–6 g/kg/day), and provision of micronutrients are essential for success.[13] The result suggests that short term VCNC supplementary nutrition was helpful to borderline malnourished children to overcome/improve their malnutrition grades in short period.

Sanghvi Jet al[14] study done at Madhya Pradesh studied Predicators for Weight Gain in Children treated for Severe Acute Malnutrition showed that other than therapeutic diet, factors such as occurrence of recurrent infections, presence of systemic illness, and socioeconomic status play an important role in deciding the weight gain in children treated for SAM. To reduce childhood malnutrition due emphasis should be given in improving the knowledge and practice of mothers on appropriate infant and young child feeding practices.[14]

Conclusion:

In the current study, 7.3% children achieved the target (>15%) weight gain. There was no obvious

difference of weight gain between boys and girls. The number of children who achieved the target (>15%) weight gain was significantly higher in rural than urban area. VCNC supplementation for 1 month was not found adequate to give sustained result. Extension of VCNC intervention to longer than one month may give the better and sustained malnutrition improvement. Evaluation after six months of intervention including compliance of continued feeding at home is also recommended.

Declaration:

Funding: Nil

Conflict of Interest: Nil

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Assessment of Life Quality Index among Patients with Acne Vulgaris in a Tertiary Care Hospital, Karamsad, Gujarat: A Cross-Sectional Study

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Abstract:

Introduction: Acne Vulgaris affects nearly 85% of adolescents. Patients with acne shown to have social, psychological, and emotional impairments. **Objective:** To identify the psychosocial impacts on health-related objects of life. **Method:** This was a hospital-based, cross-sectional study done at rural tertiary care teaching hospital (Shree Krishna hospital) from October 2019 to November 2019 at Karamsad, Gujarat. Patient aged more than15 years with acne vulgaris were included in the study. According to our inclusion criteria, total 152 patients were included in the study. Grading of Acne vulgaris and its sequelae was done by dermatologists and Quality of Life (QoL) was assessed by using the Dermatology Life Quality Index (DLQI) questionnaire. **Results:** Most cases (51.97%) were among 15-20 years. The study population included 61(40%) cases with females exceed males. Facial acne was the most common (64.47%). Acne scars were seen in 85.52% of cases. Also, acne scars were more common in males (45%) than females (40%). On interpreting dermatology life quality index score, it was found that 99 % of patients had elevated DLQI scores and Mean DLQI score was 3.05. **Conclusion:** This study showed a significant impairment of QoL in acne vulgaris patients. Quality of life worsened with the advancement in age, in chronic acne (longer duration of disease), and increase in severity of acne and the presence of post-acne hyperpigmentation.

Keywords: Acne Vulgaris, Adolescent, Quality of Life

Introduction:

The World Health Organization (WHO) defines the quality of life as "the individual's perception of their position in life among the context of the culture and value systems throughout that they live and about their goals".[1] Acne vulgaris is a chronic inflammatory disorder of the pilosebaceous gland, that runs a chronic course and it's self-limiting.[2] There are four stages of acne - Comedones, papules, pustules and cysts[3] and in more severe cases, nodules and pseudocysts may be seen. Acne vulgaris is a common skin disease that affects approximately 9.4% of the world's population with the highest prevalence among adolescent. Acne vulgaris ranked 8th in the list of most prevalent diseases with a global prevalence of 645 million in the world in 2010. Approximately 80 % of people are affected by acne vulgaris between the onset of puberty and 30 years of age. By the end of 2026, the number of people affected by acne in India is estimated to reach nearly 23 million.[1] It affecting more than 85% of adolescents and in 50% of cases, it extends into adulthood. [4] Acne affects mainly the face and facial appearance is an important aspect of an individual's

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Singh US, Nair P, Sarvaiya D, Dodiya A, Cyclewala A, Patel A, et al.Assessment of life Quality index among patients with acne vulgaris in a tertiary care hospital, Karamsad, Gujarat: A cross-sectional study. Healthline. 2021; 12(4):20-26 .
	DOI : 10.51957/Healthline_264_2021	

realization of body image patient may feel socially isolated and emotionally distressed as a result of appearance and also severe acne affects the self-confidence and may lead to depression and anxiety. [1] The major complications of acne are scarring and psychological distress which persists long after active lesions have disappeared which may lead to depression, suicidal thoughts or even suicide attempts. Acne affects the functional abilities of individuals and patients have a higher rate of unemployment when compared to those without acne. Acne also may hurt personal relationships, sports activities and employment opportunities in teens and young adults. [2]

The prevalence of psychological impact in patients with skin disease is estimated to be 30-60%. It affects both males, as well as female but males, are more susceptible than females.[4] Acne affects the functional abilities of individuals and patients have a higher rate of unemployment when compared to those without acne. Acne also affects personal relationships, and employment opportunities among adolescents and young adults. Some studies have mentioned the psychological impact of acne vulgaris such as anxiety, depression, emotions, self-identity, self-esteem, and suicidal tendency. There are various factors like age, sex and personality, the grade of acne and scarring determine a psychological aspect of acne vulgaris, Majority of times clinicians mostly deal with the clinical manifestation but also needed to focus on the psychological aspects of disease by assessing patients' quality of life (QOL) and self-esteem associated with a considerable psychosocial burden.[3] The clinicians must take into account regarding clinical as well as psychological management of acne as it affects a patient's quality of life.

The present study was carried out to determine the impact of acne vulgaris on quality of life among patients of different grades of acne patients in different age groups. Assessment of impact of acne Vulgaris on health-related quality of life (QoL) is needed to fully characterize the overall disease burden and treatment effectiveness. The use of QoL questionnaires helps to understand how acne affects the patient's routine life. One such questionnaire is the dermatological life quality index (DLQI) developed by Finlay and Khan, DLQI is widely used in research and clinical practice to assess changes in health-related QoL, as it is a sensitive measure.[8]

Aim : To assess the impact of acne and its sequelae on the QoL.

Objective: To identify the psychosocial impacts on health-related objects of life.

Method:

This study was conducted after due permission from the institutional ethics committee (IEC) of Pramukhswami Medical College. It was a hospital-based cross-sectional study done in the dermatology department at a rural tertiary care teaching hospital (Shree Krishna hospital) from October to November 2019. A total 152 participants were included in the study as per convenient sampling.

Patient aged 15 years and above with a clinical diagnosis of acne vulgaris were included in the study after obtaining informed written consent in English or Gujarati. Patient with a known history of mental disorders or with a concurrent somatic disease that can affect their mental status were excluded.

A detailed history about of a presenting complains, duration of acne etc. were elicited. The cutaneous examination was done by a two dermatologist on all patients and the following were noted

1. Type of skin (Dry/normal/oily)
2. Site of the lesion (face, chest, or back)
3. Grade of acne
4. Post acne hyperpigmentation (present/absent)
5. Acne scars

Acne vulgaris was graded as[7]:

Grade 1: Comedones, occasional papules

Grade 2: Papules, comedones, few pustules

Grade 3: predominant pustules, nodules, abscesses

Grade 4: Mainly cysts, abscesses, widespread scarring

Acne scars (all types included) were graded[9]:

Mild: < 5 scars

Moderate: 5-10 scars

Severe :> 10 scars

In this study, after obtaining written consent from participants the questionnaire which is introduced by Finlay and khan which is widely used to assess the quality of life.[8] DLQI is a validated questionnaire which grades QoL by assessing the following domains: (a) physical symptoms and feelings (questions 1 and 2), (b) daily activities (questions 3 and 4), (c) leisure (questions 5 and 6), (d) work/collage(questions7), (e) relationships specifically personal(questions 8 and 9), and (f) treatment regarding (question 10). Each question is scored as "very much" (score 3), "a lot" (score 2), "a little" (score 1), and "not at all" (score 0), keeping in mind the problems faced the previous week due to the disease. Final DLQI score is the total of all scores (range 0–30). High scores indicate poor QoL.

DLQI score interpretation is done as follows

0-1: No effect on patient's life

2-5: Small effect on patient's life

6-10: Moderate effect on patient's life

11-20 Very large effect on patient life

21-30: Extremely large effect on patient's life

The patient was asked to fill up the DLQI questionnaire (Gujarati or English) without assistance. English version of the DLQI was translated into Gujarati by bilinguals. Forward and backward translation was done by a different translator and validated by two other members in the dermatology department.

Data collected were analysed using IBM SPSS statistics software version 26.

Chi-square test was applied to compare the categorical variables between independent groups. Value of $p < 0.05$ was considered significant.

Results:

The study population included 152 cases with females 61(40%) outnumbering males. Furthermore, maximum patients (51.97%) were among 15-20 years. As showed in Table 1, Facial acne was the most common (64.47%) followed by the involvement of both face and back together (20.39%). There was no statistically significant association between gender and site of acne. Grade 1 acne was the most common clinical type (61.84%), followed by grade 3 (24.34%) & Grade 2 acne (5.26%). Furthermore, males had more severe disease: among grade 3 acne (18.42%), 59.86% were males, and all grade 4 acne were males (1.97%). Chi square calculated value is 2.81 and P = 0.58. The result is not significant at P <0.05. A gender difference was not statistically significant. Acne scars were seen in 85.52% in cases. Also, acne scars were more common in males (45.39%) than females (40.13%), which was statistically significant ($p < 0.05$).

The majority (78.94%) had oily skin followed by a patient with normal skin (18.42%) association between the type of skin and grade of acne was statistically highly significant ($p < 0.01$). (Table 2)

Grade of acne also influenced the degree of scars with a statistical significance result ($P < 0.001$).Post acne hyper pigmentation was noted in 25% statistically highly significant association was noted between the grade of acne and post-acne hyper pigmentation ($p < 0.001$). Dermatology life quality index scores: The DLQI scores ranged from 1 to 5 with a mean DLQI score of 3.05. Mean DLQI score was highest among 15-20 years old with a moderate scar. (Table 3)

Table 1: Comparison of gender with a site of acne, a grade of acne and acne scar*

	Gender (Number of Patients)		p-Value
	Male N (%)	**Female N (%)**	
1.Site of acne			
Face	58 (63.73)	40 (65.57)	>0.05
Back	01 (1.09)	05 (8.19)	
Face and chest	07 (7.69)	03 (4.91)	
Face and back	20 (21.97)	11 (12.08)	
Face, chest and back	05 (5.49)	02 (3.27)	
2.Grade of acne			
1	50 (54.94)	44 (72.13)	>0.05
2	10 (10.98)	08 (13.11)	
3	28 (30.79)	09 (14.75)	
4	03 (3.29)	00 (00)	
3.Acne scar			
Mild	30 (32.96)	15 (24.59)	<0.05
Moderate	13 (80.21)	04 (6.55)	
Severe	01 (2.19)	05 (8.19)	
Absent	47 (51.64)	37 (60.65)	

*Pearson's chi-square test was applied to test the significance

Table 2: Comparison of a grade of acne with a type of skin, acne scars, and post-acne hyperpigmentation

	Grade of acne (Number of Patients)				p-Value
1.Type of skin	**1(Grade of acne) N (%)**	**2 N (%)**	**3 N (%)**	**4 N (%)**	
Dry	01 (1.06)	01 (5.55)	1 (2.70)	1 (33.33)	<0.05
Normal	15 (15.95)	2 (11.11)	10 (27.02)	1 (33.33)	
Oily	78 (82.97)	15 (83.33)	26 (70.27)	1 (33.33)	
2.Acne scar					
Mild	18 (19.14)	11 (61.11)	15 (40.54)	1 (33.33)	<0.05
Moderate	3 (3.19)	2 (11.11)	11 (29.72)	1 (33.33)	
Severe	4 (4.25)	1 (5.55)	1 (2.70)	0 (00)	
Absent	69 (73.40)	4 (22.22)	10 (27.02)	1 (33.33)	
3.Post acne pigmentation					
Absent	70 (74.46)	13 (72.22)	28 (75.67)	03 (100)	>0.05
Present	23 (25.53)	05 (27.77)	09 (24.32)	00 (00)	

*Pearson Chi-square test was applied to test the significance

Table 3: Mean DLQI scores according to age, gender, duration of acne, a grade of acne, acne scar, post-acne pigmentation

Age Years	Mean DLQI	SD	F-statistics Value p-Value
15-20	79 (3.04)	2.7	11.71 <0.05
21-25	35 (2.74)	1.5	
>25	38 (2.63)	2.0	
Gender			
Male	2.86	2.4	11.44 <0.05
Female	2.90	2.0	
Duration of acne			
0-6 month	2.11	2.09	1.74 <0.05
7-12month	2.58	2.51	
13-24month	3.75	2.0	
25-36month	2.6	1.07	
>36 month	4.6	3.78	
Acne scar			
Mild	3.18	2.65	4.43 <0.05
Moderate	3.61	2.25	
Severe	2.50	2.10	
Post acne pigmentation			
Present	2.40	1.72	0.527 <0.05
Absent	4.26	3.21	

SD: Standard Deviation, DLQI: Dermatology Life Quality Index

Table 4: Interpretation of DLQI Scores

DLQI Interpretation	No. of patients (%)
No effect (0-1)	41 (26.97%)
Mild effect (2-5)	92 (60.52%)
Moderate effect (6-10)	17 (11.18%)
Very large effect (11-20)	02 (1.31%)
Extreme large effect (21-30)	00 (0%)

DLQI: Dermatology Life Quality Index

Interpretation of the Dermatology Life Quality Index score :99 % of patients had high DLQI scores with a mild effect (Score 2- 5) being the most common (60.52%). None of the patients had a DLQI score> 20 (Extremely Large effect). Grade 2 acne had a very large effect on patients' life (8 out of 2 cases reported). Factor affecting Dermatology Life Quality Index scores was noted between DLQI scores & variables such as the age of patients, Duration & grade of acne, acne scar and post-acne pigmentation. (Table 4)

Discussion:

This hospital-based study included 152 self-reported cases of acne vulgaris in 2 months. Bincy Baby et al.[3] included 160 cases over 6 months while Abhineetha Hosthota et al.[4] included 100 cases in 3 months. Lesions of acne start around the adolescent age group and may persist even into the elderly. This study included cases 15 years or above. The mean age was 19 years, while Abhineetha Hosthota et al.[4] reported a mean age of 21 among the population of 11-20 years and Tasoula et al.[5] reported a population of 11-19 years having the mean age of 15.77 years.

Jancovic et al which showed that acne prevalence is more at the age of 16 and 17 years. According to Balakrishan et al acne is a chronic disease affecting around 85% of the adolescents.

Mean DLQI scores in this study decreased with increasing age: 3.04 in 15–20-year-old compared to 2.63 among >25-year-olds. The severity of acne worsens as age advances, which affects QoL.

This study had 40% female which corroborated with other studies. There was no gender difference in DLQI scores was noted in this study.Similar findings were reported by Durai and Nair et al.[6] indicating both genders were concerned about their appearance and self-reported acne.

Samanthula and Kodali found that 60.04% had acne for > 1 Year, in this study had acne for < 6 months meaning patients presented early for treatment.

Association between duration of acne and DLQI scores was statistically significant in this study (P< 0.05). Eleni Tasoulaet al. [5] reported that more than half (55.3%) answered that they had never sought medical help from a dermatologist. Among pupils who had never visited a dermatologist, 15% reported having bought products from supermarkets and 55.8% OTCs from pharmacies.

Facial acne alone constituted 64.47% cases through a site of acne did not influence DLQI scores in this study. Durai and Nair et al.[6] reported facial acne as the most common. Site of acne did not show any significant association with the QoL. Arbuckle et al.[7] showed 42.15% acne patients had oily skin. In this study, 78.94% had oily skin, and the relation between the severity of acne and oiliness was statistically significant (p< 0.001).

The highest prevalence of grade 1 acne (78.94%) was encountered in this study while Durai and Nair et al.[6] reported comedones to be most common (95%). No statistically significant difference association was noted between gender and grade of acne in this study.

A significant association between DLQI scores and grade of acne (p<0.05) was observed in this study, sixty (60%) a percentage of subjects in this study had acne scars. There was a statistically significant association between acne scars and DLQI scores in this study (p< 0.05). Furthermore, a gender difference in acne scars in this study was statistically significant (p< 0.05).

Post-inflammatory hyper pigmentation is a common complication of acne vulgaris, particularly pigmented skin. Post acne pigmentation was seen in 75% which was slightly higher when compared to other studies. The statistical association of post-acne hyper pigmentation with DLQI scores was highly significant (p<0.01) in this study.

Interestingly, it was found that few patients with mild scar had elevated DLQI scores which implied that even mild acne and scars can pose a cosmetic problem to some patients, diminishing their QoL.

The difference in the findings of various studies highlight the social, behavioural and cultural factors, the difference in population characteristics, individual perception, plus the study design, and assessment tool used. Though the study population in this research was rural and urban both, both genders did identify even mild acne as a significant problem and reported early for treatment, Furthermore, the effect of acne on the QoL of patients was significant.

Conclusion:

This study showed a significant impairment of QoL in acne vulgaris patients. Worsening of QoL was observed with the advancement in age, longer duration of disease, and increase in severity of acne and acne scars, and the presence of post-acne hyper pigmentation. There was no gender difference in the QoL scores. Few patients with low-grade of acne and with minimal scarring also presented higher DLQI scores, implying that even mild acne can lead to psychological morbidity. This study thus stresses the importance of assurance and counselling along with early treatment of acne vulgaris in reducing disease-related psychological sequelae and enhancing the efficacy of treatment.

Limitation:

This study was a self-administered questionnaire-based; hence there is a possibility of individual bias, prejudice to the questions.

Declaration :

Conflict of Interest: Nil

Funding: Nil

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Acceptanceof Post-Partum Family Planning among Mothers Attending for Child Immunisation Services at Tertiary Care Hospital, Kolkata

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Abstract:

Introduction: Postpartum Family Planning (PPFP) is avoidance of closely spaced and unplanned pregnancies by use of family planning services within first year following delivery. World Health Organisation (WHO) reports postpartum women to have greatest unmet need of contraception. There is further recommendation to link immunisation clinics to PPFP services. **Objectives :** 1. To assess the acceptance rate of PPFP among mothers attending immunisation clinic 2. To explore the determinants of usage, intention to use and PPFP methods used. 3. To find the reasons for non-acceptance of PPFP among the study participants. **Method :** Study participants were women attending immunisation clinic of a tertiary level teaching hospital of Kolkata for child's immunisation service. Study design was cross sectional. Systematic random sampling technique was used to recruit participants. Data was collected by interviewer administered semi-structured questionnaire. Frequencies and percentages for categorical variables while mean and standard deviation for continuous variables were calculated. Crude Odds ratio with 95% confidence interval was calculated to explore strength of association between PPFP acceptance and independent variables. **Results :** About 1 in every 3 women (37.36%) was PPFP acceptor; intra uterine device was the most commonly used method. Odds of acceptance was lower for respondents' age <25 years and primipara whileit was higher for exposure to counselling, having male child, resumption of sex and past use of contraception. Fear of adverse effects was the most common reason for non-acceptance of PPFP. **Conclusions:** PPFP acceptance was low, however among acceptors long acting reversible contraceptives were more commonly accepted methods. There is scope to improve PPFP acceptance with intensified contraceptive counselling during delivery and immediate hospital stay as women were afraid of adverse effects of contraceptives.

Keywords: Counselling,Intrauterine Devices, Long-Acting Reversible Contraception,Postpartum Period

Introduction:

Postpartum Family Planning (PPFP) means avoidance of closely spaced and unplanned pregnancies by use of family planning services within first 12 months following delivery.The purpose of PPFP is to help women to decide, initiate and continue an appropriate modern contraceptive based on her fertility desire.[1] PPFP acceptance varies between countries; acceptance rate of PPFP in India is around 30%.[2,3] According to the 5th round of National Family Health Survey (NFHS-5), unmet need for spacing in West Bengal is 3% but it has remained

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Datta M, Lahiri A.Acceptance of Post-Partum Family Planning among Mothers Attending for Child Immunisation Services at Tertiary Care Hospital, Kolkata. Healthline. 2021; 12(4):27-33 .
	DOI : 10.51957/Healthline_252_2021	

unchanged from the previous round. Use of effective reversible postpartum methods like Intrauterine Contraceptive Devices (IUCD) and injectable contraceptive were very low at 2.2% and 0.7% respectively.[4] As per NFHS-4 report there was 5% induced abortion and 36% of the abortions were conducted at home. Such high rate of induced abortion indicates possible underestimation of unmet need. In the same survey median birth interval was reported to be 43 months but 6% births took place within 18 months, 17% within 24 months and 40% within 36 months of previous delivery.[5] Birth-to-pregnancy interval of less than 12 months are more likely to end in adverse outcomes such as unsafe induced abortion, spontaneous abortion, postpartum bleeding and anemia. There is also increased risk for stillbirth, preterm birth and low birth weight. Higher likelihood of childhood chronic undernourishment, stunted growth and infant mortality is associated with closely spaced births. [6-8] World Health Organisation (WHO) reports postpartum women to have greatest unmet need of contraception and advocates an optimum birth interval of at least 36 months.[1] There is further recommendation to link immunisation clinics to PPFP services.[9] Such intervention can help women to accept modern contraceptives which are safe for lactating women and also help them in timely transition from lactational amenorrhoea method (LAM) to a modern contraceptive. Hence PPFP is presently a vital element of comprehensive maternal healthcare services which will likely allow women, families and nations to realise their fertility goals.

In accordance to the above mentioned background, a cross- sectional study was planned among women attending immunisation clinic with their infants. The objectives were to assess the proportion of PPFP acceptance, methods used and intention to use, the variables associated with use of PPFP and the reasons for unwillingness to use PPFP.

Method:

The present study was of cross-sectional design conducted at Medical College Kolkata. Overall study duration was of six months; October 2019 to March 2020, with data collection period from November 2019 to January 2020. Inclusion criteria were women who had a live birth within last 6 weeks to 12 months and were attending immunisation clinic for immunisation of her child. Women unwilling to participate or unwilling to give consent were excluded. All women post data collection was provided with counselling on long acting reversible contraceptives (LARC).

Considering a priori probability of 30% (women who accepted PPFP), α value of 0.05, absolute error of 10% and non-response rate of 10%, the sample size was calculated to be 93.[2,3] Systematic random sampling method was used for participant recruitment. Daily target for recruitment was five participants. Around 30 eligible beneficiaries were expected to attend immunisation clinic every day. So, sampling interval was six. A predesigned, pretested, structured schedule was used for data collection. The schedule had two parts, part I for all participants and part II was for non-acceptors which included items related to PPFP awareness, intention to use PPFP and reasons for non-acceptance. All interviews were conducted by the researchers; each interview was 20 minutes in duration. Variables captured by part I of the schedule were current use of PPFP, if used then type of method, demographic variables such as age in completed years, parity, education and type of family, other variables like time since last delivery, whether have a male child, past use of contraceptive, whether received contraceptive counselling and whether resumed sexual activity. Operational definitions were required for some variables. Education was categorised and defined as primary level or passed fifth standard, secondary level or passed tenth standard and higher secondary or passed twelfth standard. Fertility intention was categorised as do

not want to space or limit pregnancy, want to space or limit pregnancy or unsure (if not able to decide on the previous two categories). Past use of contraceptive was considered as ever use of any modern method before the present childbirth irrespective of duration or consistency. Data from completed schedules was coded and tabulated in a Microsoft Excel spreadsheet. Frequencies and percentages were calculated for categorical variables; mean and standard deviation were calculated for continuous variables. Acceptance or non-acceptance of PPFP was the dichotomous outcome variable; Crude Odds Ratio (COR) with 95% Confidence Interval (CI) was calculated to see if odds of acceptance were significantly higher for one category compared to other. The study protocol was reviewed and accepted by Institutional Ethics Committee of Medical College Kolkata.

Results:

Complete data was available for 91 participants. Mean age of the participants was 25.66 years with a standard deviation of 2.84 years. Background demographic and obstetric characteristics of the participants are detailed in Table-1. Higher proportions of women were primipara and belonged to nuclear family. Half of the participants were educated up to secondary level. The variable 'fertility intention' had three categories but there was nil response for the category 'Do not want to space /limit pregnancy', so this category is not shown in the table. Majority (60%) were unsure with their intention even though almost same proportion of participants had resumed sexual activity at the time of data collection.

Table 2 shows postpartum contraceptive acceptance rate, PPFP intention, different methods used by the respondents and timeto acceptance of PPFP from delivery. The primary objective of this study was to find out the acceptance rate of postpartum contraceptives among the study participants, which was 37.36%. Intrauterine contraceptive device (IUCD) was the most commonly used contraceptive method. Injectable Depot Medroxy Progesterone-Acetate (DMPA), oral contraceptive pills (OCP) and tubal ligation was the other reported methods of PPFP. Intention to accept PPFP among non acceptors was 56.14%. Initiation of PPFP method was early, within six weeks of delivery for half of the acceptors. Odds of PPFP acceptance was significantly lower for younger age and among primiparous women, it was significantly higher among those who had male child, received contraceptive counselling during antenatal checkups (ANC), used contraceptives before and have resumed sex. Those women who reported to be counselled on postpartum contraception during ANC, had highest odds of acceptance of PPFP, being about 14 times more likely to accept PPFP compared to the reference group. (Table 3)

Table 4 shows reasons stated by respondents for non-acceptance of postpartum contraception. Respondents were allowed to give multiple reasons. The most common reason cited for non-acceptance was'fear of adverse effects'. High responses were also obtained for physiological and behavioural conditions related to postpartum period, like 'not having sex', 'no need for contraception during lactation, amenorrhoea' and 'need more time to decide'.

Discussion:

PPFP acceptance in this study was a modest 37.36%, it is much lower than a study conducted at Hossana town, Hadiya zone of Ethiopia, where acceptance rate was 73.90%.[10] Such high rate was also observed in other studies done in Africa. PPFP acceptance was 80.3% in Addis Ababa (Ethiopia), 73.7% in Kafue (Zambia) and 51.1% in Western Kenya. [11,12] Part of a multi-country study on PPFP acceptance at 6 weeks conducted at Nagpur and Belgaon in India showed PPFP acceptance rate of 65.6% and 32.7%.[12] Contraceptive acceptance within 6 weeks of birth at Hossana town was

Table 1: Distribution of respondents according to their background characteristics (n=91)

Variable	Categories	Frequency (%)
Age (in years)	<25	55(60.44)
	≥25	36(30.56)
Parity	Primipara	51(56.04)
	Multipara	40(43.96)
Education	Primary or lower	17(18.68)
	Secondary	46(50.55)
	Higher Secondary/ Graduation	28(30.77)
Type of family	Nuclear	67(73.63)
	Three generation	21(23.08)
	Joint	03 (03.29)
Has a male child	Yes	53(58.24)
	No	38(41.76)
Months since last delivery	0 to 6	64(70.33)
	7 to 12	27(29.67)
Fertility intention	Unsure	55(60.44)
	Want to space/ limit pregnancy	36(39.56)
Contraceptive counselling during ANC	Yes	42(46.15)
	No	49(53.85)
Past use of contraceptive	Yes	26(28.57)
	No	65(71.43)
Resumption of sexual activity	Yes	60(65.93)
	No	31(34.07)

Table 2: Distribution of respondents according to PPFP acceptance, intention and methods (n=91)

Variables	Frequency (%)
Acceptance rate of postpartum contraceptive	34 (37.36)
PPFP intention among non-users(n=57)	32 (56.14)
Methods	
IUCD	14(15.38)
DMPA	12 (13.19)
Tubal ligation	6 (6.59)
OCP	2 (2.20)
Gap between delivery & acceptance	
<6 weeks	17 (18.68)
6-14 weeks	13 (14.28)
>14weeks to 9 months	2 (2.20)
> 9 months to 12 months	2 (2.20)

18.68% versus 19.12%.[10] In the reviewed studies majority of the participants (99.7% in Chimaltenango, Guatemala to 79.07% in Hossana town, Ethiopia) wanted to limit or space their next pregnancy as opposed to 39.56% in present study.[10,12]

Being unsure of one's fertility intention can result in unwanted pregnancies, unsafe abortions and overuse of emergency contraception. Counselling helps women to take decision about their fertility intention and contraception.[12] In the study from Hossana town 95.7% women were counselled during their perinatal and postnatal checkups about PPFP.[10] In this study we captured data on contraceptive counselling during ANC which was 46.15%. Commonest method used in Ethiopia was DMPA (55.88%); however in the present study it was IUCD (15.38%), use of DMPA was 13.19%.[10] Among the reversible methods for use by women, IUCD was the most commonly used method at the Indian study sites (12.6% and 14.6%) of the multi-country study and compared favourably with current study result.[12] Use of long acting reversible contraception (LARC) like IUCD and DMPA as a method for PPFP was lower than other reversible methods in a study done at USA.[14] Women with higher parity, resumption of sexual activity and exposure to contraceptive counselling had higher odds of PPFP acceptance in the present study which is similar to the finding from Hossana town.[10] In current study,

Table 3: Odds of postpartum contraceptive acceptance between different subgroups of respondents (n=91)

Variable	Categories	No. of respondents	Acceptors Number (%)	COR (95% CI)
Age (in years)	<25	55	15 (27.27)	0.34* (0.14-0.81)
	≥25	36	19 (52.78)	
Parity	Primipara	51	11 (21.57)	0.2* (0.08-0.51)
	Multipara	40	23 (57.50)	
Education	Primary or lower	17	5 (29.41)	0.65 (0.21-2.03)
	Secondary& above	74	29 (39.18)	
Type of family	Nuclear	67	26 (38.81)	1.27 (0.48-3.38)
	3 generation &Joint	24	8 (33.33)	
Has male child	Yes	53	25 (47.16)	2.88* (1.14-7.23)
	No	38	9 (23.68)	
Months since last delivery	0 to 6	64	23 (35.94)	0.82 (0.32-2.05)
	7 to 12	27	11 (40.74)	
Immediate Fertility intention	Unsure	55	0 (0.00)	----
	No intention	36	34 (94.44)	
Contraceptive ounselling during ANC	Yes	42	28(66.67)	14.33* (4.93-41.71)
	No	49	6(12.24)	
Past use of contraceptive	Yes	26	18(69.23)	6.89* (2.52-18.84)
	No	65	16(24.62)	
Resumption of sexual activity	Yes	60	28(46.67)	3.65* (1.31-10.16)
	No	31	6(19.35)	

*Significant

18.68% versus 19.12%.[10] In the reviewed studies majority of the participants (99.7% in Chimaltenango, Guatemala to 79.07% in Hossana town, Ethiopia) wanted to limit or space their next pregnancy as opposed to 39.56% in present study.[10,12]

Being unsure of one's fertility intention can result in unwanted pregnancies, unsafe abortions and overuse of emergency contraception. Counselling helps women to take decision about their fertility intention and contraception.[12] In the study from Hossana town 95.7% women were counselled during their perinatal and postnatal checkups about PPFP.[10] In this study we captured data on contraceptive counselling during ANC which was 46.15%. Commonest method used in Ethiopia was DMPA (55.88%); however in the present study it was IUCD (15.38%), use of DMPA was 13.19%.[10] Among the reversible methods for use by women, IUCD was the most commonly used method at the Indian study sites (12.6% and 14.6%) of the multi-country study and compared favourably with current study result.[12] Use of long acting reversible contraception (LARC) like IUCD and DMPA as a method for PPFP

Table 4: Reasons stated by respondents for non-acceptance of postpartum contraception (n=57) #

Reasons stated	Frequency (%)
Fear of adverse effects	31(54.39)
Not having sex	27(47.37)
Not necessary for lactating women	25 (43.86)
Need more time to decide	23(40.35)
Not necessary for amenorrhoeic women	21(36.84)
Interferes with sex life	17(29.82)
Fear of infertility	16(28.07)
Using natural method	15(26.32)
Lacking knowledge on all available methods	12(21.05)
Husband using condom	8(14.04)

#Among all non-acceptors, multiple responses

was lower than other reversible methods in a study done at USA.[14] Women with higher parity, resumption of sexual activity and exposure to contraceptive counselling had higher odds of PPFP acceptance in the present study which is similar to the finding from Hossana town.[10] In current study, past users of contraception were more likely to accept PPFP. One study conducted at Kenya on acceptance ofpost-partum implants, reported higher acceptance among women who previously used same method.[13]

Women's education shows variable relation with acceptance of contraception. In present study education had no relation with acceptance of PPFP. In the USA study acceptance of LARC was lowest for the group with highest education.[14] Preference for a male child is a unique feature of the patriarchal South East Asian societies, where fertility intentions often closely align with male child intention. In present study this variable was significantly associated with PPFP acceptance. A large trial from Nepal shows similar high acceptance to postpartum IUCD (PPIUCD) among women with male child. The same study also reports benefit of counselling on acceptance rate of PPIUCD.[15] One more multi-country study on PPIUCD which included study sites from both India and Nepal, reported 86% counselling rate and 34% acceptance rate from India. This study found significantly higher acceptance rate when women were counselled multiple times, especially by a counsellor.[2]

It is evident from the above discussion, PPFP acceptance varies between countries and regions within a country as a result of socio-cultural, demographic and obstetric factors. However a common finding from all studies is that quality contraceptive counselling empowers women to take decision and accept PPFP. Counselling can also help women to accept LARCs as a spacing method and thus reduce number of clinic visits and related expenditure. The full range of contraceptive choice in postpartum period should be available to all women. Besides quality contraceptive counselling, ensuring regular contraceptive supply is also essential to achieve higher coverage. In current study less than half of the respondents reported to have received contraceptive counselling. Most stated reasons by respondents in present study for non acceptance of contraception were myths related to contraception which could have been effectively managed with proper counselling.

Strength of this study is the selected setting of immunisation clinic with opportunity to know the PPFP practice as opposed to postpartum wards or well baby clinics where many women can only reveal their PPFP intention. Further this study explores the practice related to entire choice of PPFP available in Indian public sector rather than the narrow focus on a single method.

Limitations of the study : Small sample size and inclusion of only a single study site is a limitation of the study. However as contraceptive decision is heavily influenced by individual and local factors even small sample studies can provide useful insights.

Conclusion:

It can be concluded from the study, that PPFP acceptance was low among the study population. This finding is likely due to lack of contraceptive readiness rather than contraceptive inhibition as half of the non-acceptors expressed intention to accept PPFP. Perceived negative myths and lower coverage of contraceptive counselling further contributed.

Recommendation:

This study finding indicates there is possible scope to improve PPFP acceptance with intensified contraceptive counsellingespecially with focus on the LARC methods.It is recommended that counsellors should be posted at immunisation clinics to facilitate this process. Quality evaluation of contraceptive counselling can be an area of further research.

Declarations:

Funding:Nil

Conflict of interest: Nil

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Prevalence of Anemia and its Determinants among Elderly People of Uttarakhand, India

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Abstract:

Introduction: Anemia is a sign of serious disease at all ages; but in elderly population it is especially true. According to epidemiologic data, its prevalence rises with increasing age sharply after the age of 60years. **Method:** To evaluate the prevalence of anemia and its determinants among older age group in Uttarakhand, NFHS-IV (2015-16) data was used. For socio demographic analysis, study included 7056 individuals (after excluding missing information) aged 60 years and above. **Results:** The median age was 66.38 years (range, 60–95 years). The mean levels of hemoglobin (Mean ± SD) were 14.23 ± 1.29 g/dL in men and13.75 ± 1.15 g/dL in women, and the overall prevalence of anemia was 36.42% (2502/6870): In men the prevalence was 36.86 % (2096/5687) and 34.32% (406/1183) in Women. The Prevalence in age group 60–69, 70–79 and ≥80 was 35.2%, 38.1% and 41.2% respectively. It was found that the prevalence of anemia differed significantly between those of age 60–69 and 70–79 years, those of age 60–69 and ≥80 years, and those of age 70–79 years and ≥80 years. **Conclusion:** The prevalence of anemia among elderly people of Uttarakhand was determined to be 35.9% and it increased with age. Male sex, older age, low Body Mass Index (BMI), low education and nuclear family were identified as independent risk factors of anemia among the elderly Indians.

Keywords: Anemia, Elderly People, NFHS-IV, Prevalence

Introduction:

According to census 2011 the percentage of elderly population (> 60 years) has gone up 5.7%,which was 5.3% as per census 2001. The increase in the elderly population will impose a greater burden on the already outstretched health services in our country.[1] Anemia is a major disease in the older population, and the prevalence of anemia rises with increasing age. Although it was previously believed that declines in hemoglobin levels might be a normal consequence of aging, evidence has accumulated that anemia does reflect poor health and increased vulnerability to adverse outcomes in older persons.[2] Even in persons 85 years and older, those meeting the World Health Organization (WHO) definition of anemia were found to have higher subsequent mortality rates than persons who were not anemic.[3] Studies indicated that the prevalence of anemia increases with advancing age and under age 75 years, anemia is more common in females, but over age 75 years it is more common in males.[4] Despite the high prevalence of anemia among elderly

Quick Response Code

Access this article online

Website : www.healthlinejournal.org

DOI : 10.51957/Healthline_267_2021

How to cite this article :

Maheshwari S, Gupta P, Srivastava A, Saxena S. Prevalence of Anemia and Its Determinants among Elderly People of Uttarakhand, India. Healthline. 2021; 12(4):34-39 .

in India and the increasing size of the geriatric population, only few studies have examined the effects of anemia on elderly patients.[5]

The increased incidence of anemia with aging has led to speculation that lower hemoglobin levels may be normal consequence of aging. However, there are at least two reasons for considering anemia in the elderly as a sign of disease.[5] First, older people maintain a normal red cell count, hemoglobin and hematocrit. Second, in most elderly an underlying cause of anemia is found for hemoglobin levels of less than 12g/dl. Anemia should not be accepted as an inevitable consequence of aging. The objectives of this cross-sectional study were to assess the prevalence of anemia and its determinant factors for anemia among older Uttarakhand residents.

Method:

National Family Health Survey (NFHS-IV), coordinated by the International Institute for Population Sciences (IIPS) under the aegis of the Government of India, was conducted in 2015-16.[6,7] The NFHS-IV included several biomarker measurements including hemoglobin levels. Prevalence of anemia and its determinants among elderly people of Uttarakhand was analyzed by using data of NFHS-IV.[8] Height and weight data are used for assessing nutritional levels of the population. Record of Hemoglobin levels were used to identify the prevalence of Anemia. Data of all the persons aged 60 years and more were analyzed. After excluding missing information, the final sample of 7056 was included for socio demographic analysis. Analysis regarding anemia was done for 6870 individuals for whom hemoglobin estimation data were available.

Statistical Analysis : The study subjects were categorized into three groups according to age (of age 60–69, 70–79, and ≥80 years). Firstly, basic descriptive analysis for bio-socio demographic factor was done for male and female separately. With the help of chi square test association of different bio socio demographic factor was found out. Differences in the hemoglobin levels of the age groups were analyzed using ANOVA with Turkey's multiple comparisons test.

Results:

Data of total 7056 elderly individuals were extracted after excluding missing information. Out of those 5848(82.99 %) males and 1208(17.14 %) were females. The present study divided the data gender wise to explore their bio-socio and demographic characteristics. Around 43 % of males were urban resident while 53% females were urban dwellers. More Males were living in nuclear family as compared to females. Females were more illiterate than males. (Table 1)

Table 2 presents the association of anemia with socio-demographic factors. Here, the results revealed that anemia is significantly associated with age, respondent caste, standard of living index, household structure, education and Body Mass Index at 5% level of significance.

The association of anemia with different variables, prevalence of anemia and hemoglobin level by age group were observed. Total 35.9% elderly individuals were anemic. Prevalence of anemia differed significantly between males (36.9%) and females (34.3%) (p=0.099). Significant difference in prevalence of anemia was found between different age groups as analyzed by ANOVA (p =0.021). (Table 3)The Prevalence of anemia by age group was analyzed by the multiple comparison method with Bonferroni's adjustment. Significant differences were found between the anemia prevalence in those of age 60–69years and those of age70–79 years (p=0.003), between age 60–69 years and ≥80 years (p=0.012), and between those of age 70–79 years and of age ≥80 years (p= 0.0474).

Logistic regression testing was performed to identify independent risk factors for anemia among the elderly. The parameters identified as independent risk factors of anemia were; a female sex, an old age, a lower BMI, nuclear family and

Table1: characteristics of study subjects

Variables	Male n (%)	Female n (%)
Age		
60-69 years	3893(66.6)	776(64.2)
70-79 years	1505(25.7)	329(27.2)
80+years	450(7.7)	103(8.5)
Residence		
Urban	2515(43.0)	640(53.0)
Rural	3333(57.0)	568(47.0)
Religion		
Hindu	4329(74.0)	864(71.5)
Muslim	647(11.1)	124(10.3)
Others	872(14.9)	220(18.2)
Caste		
General	2363(40.4)	499(41.3)
OBC	1987(34.0)	385(31.9)
SC/ST	1498(25.6)	324(26.8)
Standard of living index		
Low	767(13.1)	191(15.8)
Medium	1708(29.2)	332(27.5)
High	3373(57.7)	685(56.7)
Household Structure		
Nuclear	1376(23.5)	205(17.0)
Non- Nuclear	4472(765)	1003(83.0)
Education		
Illiterate	2217(37.9)	882(73.0)
Primary	1292(22.1)	178(14.7)
Secondary	1850(31.6)	126(10.4)
Higher	489(8.4)	22(1.8)
Body Mass Index		
Underweight	1409(24.1)	272(22.5)
Normal	3575(61.1)	748(61.9)
Overweight	599(10.2)	126(10.4)
Obese	265(4.5)	62(5.1)
Marital Status		
Unmarried	16(0.3)	4(0.3)
Married	5088(87.0)	83(6.9)
Widows/Divorced Not living together	744(12.7)	1121(92.7)
Anemic		
Yes	2096(36.9)	406(34.3)
No	3591(63.1)	777(65.7)

education. As age increases chances of being anemic is 59% more. Female had 12 % more chances of being anemic as compared to men. An elder person dwelling in nuclear family was two time more prone for becoming anemic. (Table 4)

Discussion:

Anemia is a severe public health problem (prevalence of anemia ≥40%) in the rural areas of Uttarakhand State, India.[8,17] In the past, anemia in the elderly has been considered a part of the normal physiologic process.[8,9] At the present time, however, anemia in the elderly is considered a type of pathologic condition caused by under lying diseases.[4-6] Thus, anemia is no longer viewed as an accompaniment of aging and should not be attributed to natural senescence. In this study, we assessed the prevalence of anemia in Uttarakhand, India. Our results show that the prevalence of anemia among elderly was 35.9%. In present study significant difference in prevalence of anemia was found between different age groups. Other studies have also mentioned the same finding. [4,9,10]

Male sex, older age, low BMI, low education and nuclear family were identified as risk factors of anemia. It should be noted that the old age, low BMI factors are all associated with chronic illness and co-morbid conditions.[11] Higher education leads to higher capability to obtain information about the consequences of behavior regarding food intake or to healthier lifestyle. An old aged person living in nuclear family has less financial and social support,

Table 2: Association of Anemia with different bio-socio and demographic factors

Variables	Not Anemic n(%)	Anemic n(%)	Total	χ2(df, p value)
Age (years)				
60-69	2939(64.8)	1596(35.2)	4535	10.39 (2,0.006)*
70-79	1112(61.9)	684(38.1)	1796	
≥80	317(58.8)	222(41.2)	539	
Gender				
Male	3591(63.1)	2096(36.9)	5687	2.72 (1,0.053)
Female	777(65.7)	406(34.3)	1183	
Residence				
Urban	1940(62.6)	1157(37.4)	3097	2.15 (1,0.143)
Rural	2428(64.6)	1345(35.6)	3773	
Religion				
Hindu	3323(64.2)	1851(35.8)	5174	5.24(2,0.075)
Muslim	484(63.2)	282(36.8)	766	
Others	561(60.3)	369(39.7)	930	
Caste				
General	1022(39.5)	1564(60.8)	2586	30.83(2,0.000)*
OBC	939(36.8)	1614(63.2)	2533	
SC/ST	541(31.3)	1190(68.7)	1731	
Standard of living Index				
Low	585(75.2)	193(24.8)	778	92.43(2,0.000)*
Medium	1422(67.6)	683(32.4)	2105	
High	2361(59.2)	1626(40.8)	3987	
Household Structure				
Nuclear	1171(78.0)	330(22.0)	1501	172.80(1,0.000)*
Non- Nuclear	3197(59.5)	2172(40.5)	5369	
Education				
Illiterate	1968(65.6)	1032(34.4)	3000	13.60(3,0.000)*
Primary	934(64.1)	524(35.9)	1458	
Secondary	1158(60.8)	748(39.2)	1906	
Higher	308(60.9)	198(39.1)	506	

Body Mass Index				
Underweight	1116(67.1)	546(32.9)	1662	33.87(3,0.000)*
Normal	2655(64.0)	1499(36.0)	4164	
Overweight	403(56.1)	316(43.9)	719	
Obese	184(56.6)	141(43.4)	325	
Marital Status				
Unmarried	9(45.0)	11(55.0)	20	3.03(2,0.219)
Married	3210(63.7)	1826(36.3)	5036	
Widows/ Divorced Not living together	1149(63.3)	665(36.7)	1814	

* Significant at 5% level of significance

Table 3: Mean Hemoglobin and Prevalence of Anemia among different age groups

Variables	Age Groups (Years)			
	60-69 years (n= 4535)	70-79 years (n=1796)	>80 years (n=539)	p value*
Hemoglobin(g/dl)	13.6±1.6	12.7±1.3	11.8±1.8	0.004
Prevalence of Anemia	1596(35.2)	684(38.1)	222(41.2)	0.021

* p values are by analysis of variance (ANOVA) as per ANOVA Turkey's multiple comparisons are performed

Table 4: Odds Ratio for Anemia by Logistic Regression Analysis

Variables	Estimate	Std err	OR (95% CI)	p value
Age	0.15	0.21	1.59(1.1-1.97)	0.002
Education	-0.58	0.03	0.56(0.45-0.68)	0.014
Female	0.18	0.07	0.88 (0.07-1.27)	0.321
Nuclear Family	1.21	0.45	2.41(2.10-2.75)	0.024
BMI	-0.25	0.27	0.87(0.45-0.96)	0.047

*Abbreviations: std. err=standard error; OR=odds ratio; CI=confidence interval; BMI= body mass index

lack of personal care, healthier food style and healthier living environment. The cross-over effect whereby men are more likely than women to have anemia at older ages reflects the application of sex-specific criteria for defining anemia.[12,13] The health improvement of the nation is based on its management information system. National Family Health (NFHS) surveys conducted periodically are a reminder for India to wake up and respond to the urgent issues that have been lingering through decades. Though strategies are being revised periodically, there is need for financial support, awareness generation and most importantly political commitment.[14,15] A study conducted by Gupta et al

has highlighted the need for primary care physicians to undertake regular testing and provision of treatment for anemia among the elderly population.[16] No nutritional anemia in older adults has been documented to result from an interaction between an increased inflammatory milieu and age-related co morbidities. [17]

Conclusion:

The prevalence of anemia among elderly people in Uttarakhand was determined to be 35.9% and it increased with age. Male sex, old age, low BMI, low education and nuclear family were identified as independent risk factors of anemia among the elderly Indians. Anemia among elderly is an important public health problem in India. The actions at the national level need to be directed towards meeting these challenges in a rational, coordinated and unbiased manner with total commitment towards achieving the desired goals.

Declaration:

Funding: Nil

Conflict of Interest: Nil

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Maternal Factors Associated With the Birth Weight of the Babies in a Rural Area of North Karnataka : A Cross Sectional Study

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[4] Assistant Professor, Department of Srivastava AK, Mannapur BS, Dorle AS, Singh A. Maternal Factors Associated With the Birth Weight of the Babies in a Rural Area of North Karnataka: A Cross Sectional Study Obstetrics and Gynaecology, United Institute of Medical Sciences, Prayagraj, Uttar Pradesh, India

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Abstract:

Introduction: Birth weight is a reliable indicator of intrauterine growth and is one of the major factors that determine child survival and its physical and mental development. There is no indicator in human biology which tells us so much about the past events and the future life, as the weight of an infant at birth. Low Birth Weight (LBW) is still a major public health problem in developing countries and majority of it is seen in Africa and Asia. The prevalence of LBW in India has although reduced over the past decade, but it still remains high in some of the states of the country. **Objective:** To estimate the prevalence of Low birth weight and to study the maternal factors associated with it. **Method:** A Cross-sectional study was conducted in a village of north Karnataka from December 2015 to May 2017. Sample size calculated was 337. The study participants comprised of postnatal mothers with singleton live born baby. Weight of the newborn was recorded. Chi square test was used to find the association. **Results:** The prevalence of LBW was found to be 21.1%. A number of factors such as mother's age, height, number of hours of rest, tobacco consumption, passive smoking, gravidity, parity, previous history of LBW, time of antenatal care (ANC) registration, haemoglobin, bad obstetric history, type of delivery and gestational age at delivery were found to be significantly associated with LBW. **Conclusion:** Adverse pregnancy outcome is the result of a multiple factors. Prevalence of LBW can be reduced by regular ANC, balanced diet and adequate rest during antenatal period, and avoiding tobacco consumption. Thus, it calls for overall improvement in the ANC.

Keywords: Low Birth weight, Maternal Factors, Rural

Introduction:

For new born health and survival, Low Birth Weight (LBW) is an important predictor. It is associated with high-risk infant and childhood mortality.[1] Low Birth weight is defined as a birth weight of less than 2.5 kg (up to and including 2499 grams), the measurement being taken preferably within the first hour of life, before significant postnatal weight loss has occurred.[2] Birth weight is a good indicator of intra uterine growth and also it determines physical and mental health.[3] It is a prospective marker for new-borns future growth and development and retrospective marker for the mother's health and nutritional status.[4]

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Srivastava AK, Mannapur BS, Dorle AS, Singh A. Maternal Factors Associated With the Birth Weight of the Babies in a Rural Area of North Karnataka: A Cross Sectional Study. 2021; 12(4):40-46 .
	DOI : 10.51957/Healthline_269_2021	

In 2015, an estimated 14.6 per cent of all babies born globally suffered from low birthweight.[5] In developing countries, LBW is the most important public health problem. Africa and Asia accounts for most of the LBW babies globally.[6] In India the prevalence of LBW has although declined over the past few years, but the progress is slow and still many states have high prevalence of LBW.[7]

The prevalence of LBW in India ranges from 10% in high socioeconomic class to 56% for the poor slum community. The higher prevalence of LBW was found in rural are as and urban slums.[4] The data for 2014 shows the prevalence of Low birth weight babies in India as 18.6 per cent, while in Karnataka was 17.2 per cent.[8]

LBW increases a child's school-age learning disability. The child born with a LBW also leads huge economic costs, including higher medical expenditures and decreased productivity in adulthood.[9]

The UNICEF (United Nations Children's Fund) and WHO (World Health Organization) in 2015 estimated that one in seven live-births suffered from low birth weight and among that half of them are from Southern Asia. Reducing LBW is recognized as a most important public health priority. The Global Nutrition Targets were adopted in 2012 and now it is a global commitment. In 65th World Health Assembly (WHA), the target of a 30 per cent reduction in Low birth weight globally was set between 2012 and 2025 for the member states.[10]

The factors responsible for Low birth weight differ from one area to another, depending upon geographic, socioeconomic and cultural factors. That is why it is necessary to identify factors responsible for low birth weight, so that the strategy can be planned to tackle this important problem.

In India, majority of the studies done on determinants of birth weight are hospital based. Data from hospitals is generally associated with uncertainties and biases.[11] Hence this study was carried out to estimate the prevalence of Low birth weight babies and study the maternal factors associated with it.

Method:

A Cross-Sectional study was conducted in a rural field practice area of S. N. Medical College, Bagalkot, Karnataka from December 2015 to May 2017 for a period of 18 month. This study was undertaken in the village of Shirur, which is the rural field practice area of S. Nijalingappa Medical College, Bagalkot, Karnataka, it is situated about 17 km to the south east of Bagalkot city. The population covered is 17,512.

Sample size calculation:

Sample size was calculated based on the study done by Metgud C. S. et al[11] where prevalence of LBW was 22.9%, by using the formula $n = 4pq/l^2$ where p = prevalence of LBW (22.9), q = 100-p (77.1) and l is the allowable error for p (20% of p is 4.58). So, the sample size came out to be 337.

Selection of study participants:

The participants' eligible for the study, comprised of all postnatal mothers with singleton live born baby residing in the village "Shirur", within the duration of study till the sample size was achieved.

Inclusion criteria for the study group:

Postnatal mothers with singleton live born baby and resident of the village.

Exclusion criteria for the study group:

1) Mothers not willing to participate in the study.
2) Mothers who cannot be reached after three consecutive attempts.

Ethical clearance and Informed consent:

Ethical clearance was obtained from institutional ethical committee and informed consent from study participants.

Study tool and Data collection:

The data was collected by approaching mothers either in hospital or home through pre-designed pre-tested semi-structured questionnaire. Weight of the new-born of mothers registered in the study was recorded from their health records. The available health records were also reviewed for other variables.

Statistical analysis:

Data was entered in Microsoft Excel 2007 spread sheet, and subsequently it was analysed using SPSS (trial version 20) and Open Epi software. Percentage and proportions were used for descriptive statistics and chi square test was used for finding the association. Odds ratio was used for expressing the strength of association. In case if expected value was less than 5 in more than 20% of cells in a table, Fisher's Exact test was used. p value of <0.05 was considered statistically significant and <0.001 as highly significant.

Results:

Out of 337 mothers included in the study, majority of the study participants belonged to 20-29 years of age i.e., 83.3%. Majority of participants (90.8%) were Hindu by religion. Most (47.5%) of the study participants were educated till primary school only. Majority (72.2%) of participants were housewives. 52.5% belonged to class IV followed by class V (45.7%).

Out of total 337 live new-borns, 71 were Low birth weight babies. Thus, the prevalence of LBW babies is 21.1%.

The prevalence of LBW was higher (21%) when the weight gain was less than 9 kg during pregnancy and it was11.1% in those who gained weight of>11 kg, although it was notfound to be statistically significant in this study (Table 1).

Table 2 shows, the prevalence of LBW was highest among fifth para mothers (76.5%), while it was (11.2%)in primi mothers. The increase in prevalence of LBW with parity was found to be statistically significant.

The prevalence of LBW newborn was highest in preterm babies (86.7%) as compared to term and post-term and this association was found to be statistically significant (Table 3).

Table 4 reflected that the chances of having LBW newborn was high in both young age and elderly mothers, the odds of having LBW newborn was 11.5 times higher in short statured (< 140 cm) mothers. Mothers having less than 8 hours sleep in night were seen to have more chance of LBW newborn as compared to the ones who have more hours of sleep-in night and it was statistically significant. Mothers having some substance abuses were having 3.2 times more chances of having LBW as compared to those who didn't and it was statistically significant, the chances of having LBW newborn was 2.1 times more in mothers exposed to passive smoking than those who were not exposed and it was also found to be statistically significant.

Also shown in table 4, that the chances of having LBW newborn in multi-gravida mothers was found to be higher than primigravida it was statistically significant. The odds of having LBW newborn tend to increase as the time of ANC registration delays. The chances of having LBW newborn are 7 times in hypertensive mothers than normo-tensive and it was statistically significant. The odds of LBW newborn were 17 times in case of severely anaemic mothers and it was highly significant. Mothers with bad obstetric history have 4.2 times higher chances of having LBW newborn as compared to those mothers who didn't and was statistically highly significant.

Discussion:

The maternal risk factors are biologically and socially interlinked and are modifiable. These factors are different from one place to another and depend upon the geographic, socio-economic and cultural

Table 1: Association of maternal weight gain during pregnancy with birth weight of the baby

Weight gained (kgs) during pregnancy	Birth Weight of the Baby				Total	
	Low Birth Weight		Normal Birth Weight			
	No.	%	No.	%	No.	%
<9	42	21.0%	158	79.0%	200	59.3%
9-11	25	24.8%	76	75.2%	101	30%
≥11	4	11.1%	32	88.9%	36	10.7%
Total	71	21.1%	266	78.9%	337	100%
χ^2 value = 2.971, df = 2, p = 0.226						

Table 2: Association of parity with birth weight of the baby

Parity	Birth Weight of the Baby				Total	
	Low Birth Weight		Normal Birth Weight			
	No.	%	No.	%	No.	%
1	10	11.2%	79	88.8%	89	25.8%
2	17	14.9%	99	86.8%	114	34.4%
3	21	26.2%	59	73.8%	80	23.7%
4	11	34.4%	21	65.6%	32	9.5%
5	13	76.5%	4	23.5%	17	5%
>5	0	0.0%	5	100.0%	5	1.5%
Total	71	21.1%	266	78.9%	337	100%
Fisher's exact p <0.001						

Table 3: Association of gestational age at delivery with birth weight of the baby

Gestational age at delivery	Birth Weight of the Baby				Total	
	Low Birth Weight		Normal Birth Weight			
	No.	%	No.	%	No.	%
Term	45	14.9%	257	85.1%	302	89.6%
Preterm	26	86.7%	4	13.3%	30	8.9%
Post-term	0	0.0%	5	100.0%	5	1.5%
Total	71	21.1%	266	78.9%	337	100%
Fisher's exact = 85.872, p <0.001						

Table 4: Results of binary logistic regression analysis of independent risk factors with birth weight of the baby

Risk factors	Odds ratio	95% CI	p value
Mother's age			
15-19 years	3.556	0.817-15.481	0.091
20-24 years	1	-	-
25-29 years	1.945	1.024-3.697	0.042
30-34 years	4.947	2.208-11.082	0.000
≥35 years	11.852	2.608-53.865	0.001
Mother's height			
<140 cm	11.511	3.014-43.965	0.0004
140-144 cm	6.852	2.754-17.048	0.00002
145-154 cm	1.766	0.807-3.860	0.154
>154 cm	1	-	-
No. of hours of sleep-in night			
<8	2.216	1.276-3.850	0.005
≥8	1	-	-
Substance abuse			
Yes	3.251	1.233-8.573	0.017
No	1	-	-
Passive smoking			
Present	2.092	1.208-3.623	0.008
Absent	1	-	-
Gravidity			
Primigravida	1	-	-
Multigravida	2.577	1.256-5.287	0.010
History of Previous LBW			
Yes	2.701	1.331-5.480	0.006
No	1	-	-
Time of ANC registration			
1st trimester	1	-	-
2nd trimester	1.635	0.930-2.874	0.088
3rd trimester	4.512	0.880-23.120	0.071
Blood Pressure			
Normal	1	-	-
Hypertensive	7.164	2.035-25.129	0.002
Haemoglobin (gm/dl)			
<7	17.156	4.276-68.836	0.0001
7-9.9	4.506	1.865-10.886	0.001
10-10.9	1.360	0.587-3.149	0.473
≥11	1	-	-
Bad obstetric history			
Present	4.225	2.300-7.760	0.00002
Absent	1	-	-

factors. If these risk factors are detected early and managed, LBW can be reduced and then mortality.[12]

The prevalence of LBW babies in this study was found to be 21.1% which is more than the national average i.e., 18.6%.[8] Although the prevalence in this study was found to be high, yet it is less than some of the other studies done in India probably because of better ANC registration and institutional delivery than other parts of the country. On the other hand, prevalence of LBW in this study was found to be almost similar to the study done by Metgud et al[11] which was also conducted in rural area, and it was found to be lower than some of the other community-based studies also, such as those done by Manna et al.[13]

Similar to this study, Jain S et al[14] found that the prevalence of LBW babies increased with increase in maternal age, with maximum prevalence in ≥31 year's age group (66.7%).

The odds of having LBW baby were found to be high in mothers of< 140cm height and it showed a decreasing trend as the height increases, this was found to be statistically significant (p <0.001).Manna et al[13] also showed that 39.5% mothers with short height (<145 cm) had LBW babies, which was 23.9% for mothers with height ≥ 145 cm (p=0.0001) which is similar to our study.

Johnson et al[15] found that the history of adequate weight gain during pregnancy was significantly associated with birth weight of baby, where absence of adequate weight gain was associated with higher proportion of LBW. In this study also the proportion of LBW babies reduced as the weight gained during pregnancy improved.

Similar observations were made in the study done by Manna et al[13] wherein maximum proportion of LBW babies were found among mothers who had daily sleep and rest < 8 hours(45.6%),but this came down to22.8% when the sleep & rest was ≥ 10 hours.

The odds of having LBW new-borns were higher among mothers having substance abuse as compared to those not having any substance abuse. This was found to be statistically significant (p = 0.012). Jain S et al[14] in their study, found that mothers having tobacco consumption had more proportion of LBW babies as compared to non-tobacco user.

Metgud et al[11] also observed the similar findings like the present study, that the chances of having LBW babies with exposure of mother to passive smoking is more [crude OR = 2.0, P = 0.002].

The prevalence of LBW was highest among fifth para mothers (76.5%), while it was (11.2%) in primi mothers and as the parity increased the prevalence of LBW increased in the present study. Manna et al[13] also observed similar findings wherein LBW babies were maximum (54.8%) for mothers who had 3 or more children followed by primipara mothers which was also statistically significant.

In this study, the odds of having LBW babies were 2.7, in mothers having previous history of LBW as compared to those who did not have any history of previous LBW baby. This was found to be statistically significant (p = 0.005). Metgud et al[11] also found that the chances of having LBW babies in mothers having previous history of LBW was 4.8 times more as compared to normal.

The odds of having LBW baby were17 times more, in mothers with Hb < 7 gm/dl as compared to those with normal Hb, the odds decreased as the haemoglobin level increased. This was found to be statistically significant (p <0.001). Archana paliwal et al also observed the similar pattern.[16]

Jadhao AR[17] et al found association of bad obstetric history with LBW. The present study also showed to have higher chances of LBW in case of bad obstetric history.

The prevalence of LBW newborn is highest in preterm babies (86.7%) who are followed by term babies (14.9%) while all post-term newborn were of normal birth weight. This association is found to be statistically significant (p<0.001). Jain S et al[14] found that majority of LBW babies (62.5%) were delivered prematurely and it was found to be statistically significant (p=0.043).

Conclusion:

A number of factors like teenage pregnancy, mother's height, number of hours of sleep-in night, tobacco consumption, passive smoking, gravidity and parity, previous history of LBW, time of ANC registration, mother's blood pressure, haemoglobin, bad obstetric history, type of delivery and gestational age at delivery were found to be significantly associated with low birthweight. So, adverse pregnancy outcome is the result of a multiple factors, which needs to be taken care from an early adolescent age.

Prevalence of LBW can be reduced by regular antenatal check-ups, adequate rest during antenatal period and avoiding the tobacco chewing. Thus, it calls for overall improvement in the antenatal care.

Recommendations:

Grass root level workers may be trained to support and help the pregnant women. The families of the women can also be informed, involved and educated about the proper antenatal care and maintaining good dietary habits and daily practices, so that they can help her and give moral support during this phase.

To promote the utilization of various maternal and child health government schemes, so that mothers or their family members don't face any problems in receiving their rightful benefits such as food supplementation under ICDS and provision of IFA tablets.

A proper health education should be given in order to bring about appreciable change in the knowledge, attitude and practice before and during pregnancy and also after delivery, which should cover

the aspects such as avoiding teenage pregnancy for which the family members should be educated about the risks associated with it related to the birth weight.

Declaration:

Funding: Nil

Conflict of Interest: Nil

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An Epidemiological Investigation of the Diphtheria Outbreaks Reported in a District of Gujarat

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Abstract:

Introduction: Mortality and morbidity due to infectious disease have reduced in the last couple of decades. Diphtheria is one of the infectious diseases which can be preventable with a complete immunization. **Objective :** To understand trends and identify factors affecting the outbreak of diphtheria in Banaskantha district of Gujarat. **Method :** A retrospective study based on the available case records for the years 2019, 2020 and 2021(till June). The study was conducted after the reported diphtheria cases in a district. The study was a public health response and intended to provide specific geographical recommendations to the district. The data was recorded from the reported case record and immunization registers. The data were analyzed for defined variables. **Results :** Out of the 366 cases identified during years 2019-2021. Almost 74% cases have occurred during 2019, with a 7.7% mortality rate. Total 48% of cases were among the age group of 5-10 years, with an increasing number of cases during August-December in specific geographical distribution. Among all the cases, 164 (44.5%) have never taken any vaccine in their lifetime or are unaware of the vaccination status, and 87.9% of cases have not taken third dose of DPT or Pentavalent Vaccine, which is associated statistically with the mortality. **Conclusion :** The prevalence of diphtheria cases was high in children who have not taken all three doses of DPT or Pentavalent vaccine. These have shown an essential role of immunization, focusing on the vaccine for all doses and need to create a customized awareness communication plan.

Keywords: Diphtheria, DPT Vaccine, Epidemiology, Immunization, Pentavalent Vaccine

Introduction:

Diphtheria is a severe bacterial infection caused by Corynebacterium diphtheria which may involve many body organs if remains untreated. The Greek meaning of the name suggests "Leather," which points towards the pseudo membrane, the critical feature of the disease.[1] It gets manifested within two to five days of exposure with any contaminated surfaces or through air droplets. It will get symptoms from mild sore throat and fever with grey or white discoloration of the throat to grave multisystem failure on the release of toxins in the body.

Diphtheria was one of the primary causes of mortality before introducing vaccines among children.[1] Despite the strengthening of the universal immunization program, diphtheria remains endemic

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Shah H, Patel Jay, Rana A, Sinha A, Fancy M. An Epidemiological Investigation of the Diphtheria Outbreaks Reported in a District of Gujarat. Healthline. 2021; 12(4):47-53 .
	DOI : 10.51957/Healthline_273_2021	

in India. A total incidence of 22,986 diphtheria cases was reported globally during the year 2019. India has the highest Proportin of 41.9% (n=9622) reported worldwide during 2019.[2,3] Developed countries have successfully controlled the spread of disease. However, it remains a concern for developing countries as most cases were reported through developing nations. Vaccination proves an effective tool in reducing and preventing diphtheria cases among children aged < 15 years. Children with at least three doses of diphtheria, pertussis (whooping cough), and tetanus (DPT) vaccine have shown approximately 50% efficacy against diphtheria and with more than two booster doses have shown 91% efficacy.[4] India had overall 87% coverage for the third dose of DPT vaccine with 63.2% (n=445) districts out of 704 reported above or equal to 80% coverage.[3,5] Only 61% of children in India aged 12-23 months are fully vaccinated even after more than 40 years of vaccination campaign.[6] Gujarat shows the coverage of 86.1% for the third dose of pentavalent vaccine, and Banaskantha, a district of Gujarat, having 64.1% coverage.[7,8] Multiple factors play an essential role in diphtheria cases among the community, i.e. vaccination coverage, poverty, education, hygiene and cleanliness, migration, social stigma and beliefs for vaccination etc. Borders of the states are commonly affected by diphtheria cases due to frequent to and fro movement and loss of follow-up during vaccine campaigns.[1]

Present study was conducted to understand the trends of diphtheria cases in Banaskantha district of Gujarat. Factors affecting the outbreak of diphtheria were also identified. District-specific recommendations are provided based on the available information which will be helpful in preparing the prevention plan in future.

Method:

The present record-based retrospective study was conducted on 336 confirmed diphtheria patients reported from a district of Gujarat. The records were taken from the line listing of cases with selected variables screened and identified by health staff during surveillance of vaccine preventable diseases. In June 2021, the team was formed at state health department with group of experts; and investigation was carried out with the sole objective of finding out epidemiological linkages and recommending necessary actions to control the outbreaks. The investigation team has coordinated with health department of Banaskantha district and requested all the available data of diphtheria cases of previous years. The team was provided with line list of patients identified during the diphtheria outbreaks in Banaskantha District in 2019, 2020 and 2021(till June). Variables like the number of cases, mortality rate, age group-wise bifurcation, month-wise number of cases reported, vaccination status, and correlation with mortality were identified andanalyzed. Geographical periodic year-wise analysis was also carried out to identify the distribution and identification of cases.

Case Definition:

Clinical Identification: Symptoms characterized with fever, sore throat, headache and particular greyish or whitish discoloration in the throat.[2]

Case Classification : As per the available district records, all field level staffs were trained for primary screening and identification of cases with diphtheria. All private medical practitioners (including AYUSH) were sensitized to strengthen the liaison between private and public health facilities for early referral and management. Cases with severe illness were referred at Sub District Hospital (SDH) Tharad, and those in need of a ventilator were referred to tertiary level medical college. The training and sensitization activities were carried out in February 2019 during roll out of surveillance system of Diphtheria, Pertussis and Neonatal Tetanus cases by the district health officers.

Data collection and Analysis : The yearly reports for the disease outbreak were the source of data, and due efforts were made to conceal the identity of patients. The data collection was carried out from secondary data of the case record registers, which

contains demographic, programmatic information of patients, and clinical parameters of patients filled up by health staff.

Inclusion Criteria : All cases registered by the District Health Staff.

Exclusion Criteria : Cases missed by the health staff to identify and register and cases with inadequate information.

Ethical Permission : This study was conducted as an the emergency response to outbreak and designed to provide information on to the public health response. The investigation was aimed at achieving public good (beneficence) and collective welfare (solidarity); no harm was done to any individual (nonmaleficence); fair, honest, and transparent (accountability and transparency); and participants' data were de-identified before analysis (confidentiality).

The trend of identification of diphtheria cases at Banaskantha District was described based on the data collected from the district health team. Statistical analysis was carried out for proportions and chi-square test to identify the relationship between cases, immunization status and associated variables using Statistical Package for the Social Sciences (SPSS) version 16.

Table 1: Age group and year-wise number of cases & mortality due to Diphtheria at Banaskantha (BK) district (n=366)

Age Group	Year 2019	Year 2020	Jan- June 2021	Total
	No. (%)	No. (%)	No. (%)	No. (%)
< 2 Years	13.00 (4.8)	7 (9)	4 (22.22)	24 (6.6)
2 – 5 Years	32 (11.9)	16 (20.5)	2 (11.11)	50 (13.7)
5 – 10 Years	130 (48.2)	36 (46.15)	9 (50.0)	175 (47.8)
10 – 16 Years	83 (30.7)	16 (20.5)	3 (16.7)	102 (27.9)
> 16 Years	12 (4.4)	3 (3.9)	0 (0.0)	15 (4.10)
Total	270 (100)	78 (100)	18 (100)	366 (100)

Figure 1: Month-wise number of cases identified for Diphtheria at Banaskantha district (n=366)

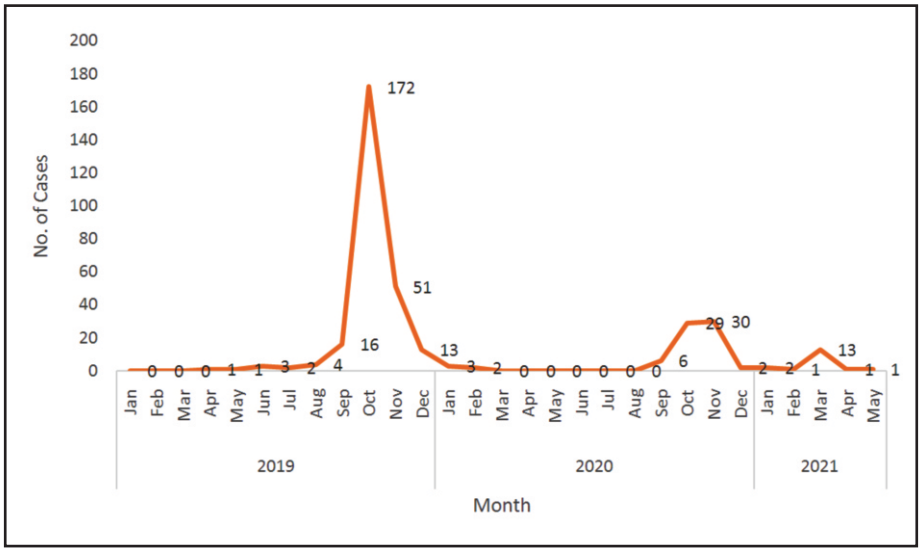
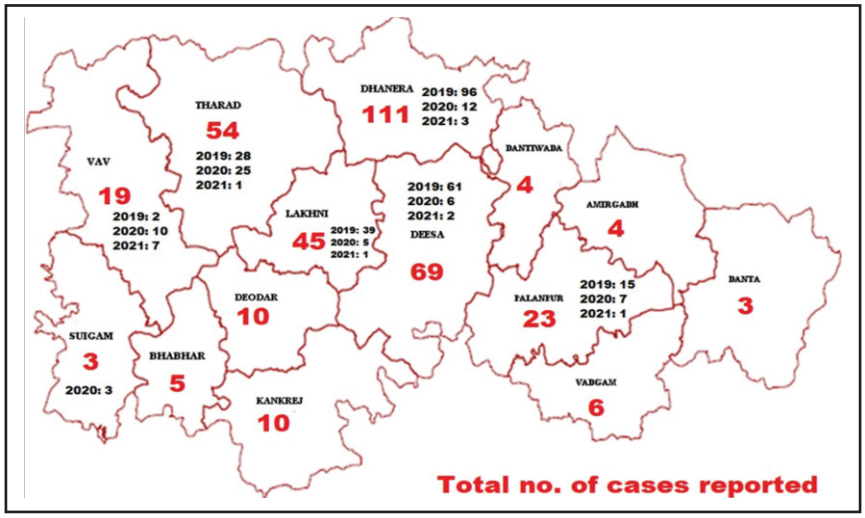


Figure 2: Block-wise distribution of Diphtheria cases for last three years in Banaskantha district (n=366)



Results:

Data for the total 366 cases identified for diphtheria during the last three years at Banaskantha (BK) district was available, out of which 73.77% was during 2019. The distribution showed that maximum cases identified during 2019 (n=270, 73.77%) followed by 2020 (n = 78, 21.3%) and 2021 (n =18,5%). Total 33 (9.01%) deaths took place, 20 (58.3%) in 2019. 10 (30.3%) in 2020 and 3 (9.09%) in 2021. Analyzing the age-wise distribution of identified cases, around half of the children (47.81%) were in the age group of 5 – 10 years, followed by 10-16 years (27.87%), 2 – 5 Years (13.66%), < 2 years (6.56%) and > 16 years (4.10%). (Table1)

Most of the cases were reported during the Sept-Dec period majority, but the last trend was observed in March 2021 with a report of three cases. (Figure1) Geographically, four blocks were commonly affected and had a maximum number of cases for diphtheria during the last three years, i.e., Deesa, Dhanera, Lakhani and Tharad.(Figure2)Out of 215 villages, 22 (10.23%) villages had been affected more than once during the previous three years in a district. This may be correlated with the migratory tribal population; and working as a laborer in big farms for all crop seasons left uncovered during the catch-up round of vaccination scheduled near Holi festival days. The tribal migratory population usually celebrates the Holi festival in their native places, so the active in and out migration would have affected the campaign.

Tables 2 showed the variables; gender, high-risk establishments, brick kilns, nomads, farm laborers, construction sites, and the recent history of travel since last month. Their vaccination status was statistically associated with the reported deaths of diphtherial disease. Out of 366 reported cases, only 70 (19.1%) cases had not received any vaccine during their lifetime, and 94 (25.7%) cases did not aware of their complete immunization status. 15 (21.4%) out of 70 cases reported deaths who have not taken any vaccine. That was associated with mortality due to diphtheria. The district immunization records showed that the third dose of diphtheria toxins containing vaccine was associated with mortality. The study found that a total of 12 (3.3%) cases had taken the third dose of vaccine, and 29 (87.9%)reported deaths had not taken the vaccines. The association was statistically significant with an adjusted odds ratio of 5.6 (95% CI 1.59 – 19.73). There was no history of taking booster doses at 10 and 16 years of age among the reported cases.

Discussion:

The current study suggests that most of the cases were reported during 2019, and then subsequent decreases over time. Mortality was also reported high during the same year. Almost half of

Table 2: Variables associated with the deaths due to diphtheria among the reported cases in Banaskantha district (n=366)

S.N.	Variables		Death due to diphtheria n = 33	Survived n=333	Total Reported Cases n=366	Chi-square p value
			n (%)	n (%)	n (%)	
1	Age Groups (Years)	< 2	5 (15.2%)	19 (5.7%)	24 (6.6%)	Chi-square = 13.760 p = 0.0081
		2 – 5	9 (27.3%)	41 (12.3%)	50 (13.7%)	
		5 – 10	15 (45.5%)	160 (48.0%)	175 (47.8%)	
		10 – 16	4 (12.1%)	98 (29.4%)	102 (27.9%)	
		> 16	0 (0.0%)	15 (4.5%)	15 (4.1%)	
2	Gender	Male	18 (54.5%)	172 (51.7)	190 (51.9)	Chi-square = 0.1007 p = 0.750969
		Female	15 (45.5%)	161 (48.3%)	176 (48.1%)	
3	High Risk Population	Yes	7 (21.2%)	48 (14.4%)	55 (15.0%)	Chi-square = 1.086 p = 0.297242
		No	26 (78.8%)	285 (85.6%)	311 (85.0%)	
4	History of recent travel	Yes	3 (9.1%)	42 (12.6%)	45 (12.3%)	Chi-square = 0.096 p = 0.7567
		No	30 (90.9%)	291 (87.4%)	321 (87.7%)	
5	History of receiving any Vaccines in lifetime	Yes	15 (45.5%)	187 (56.2%)	202 (55.2%)	Chi-square = 17.657 p = 0.000146
		No	15 (45.5%)	55 (16.5%)	70 (19.1%)	
		Unknown	3 (9.1%)	91 (27.3%)	94 (25.7%)	
6	History of 3rd dose of DPT or Pentavalent Vaccine	Yes	4 (12.1%)	8 (24.0%)	12 (3.3%)	Chi-square = 8.943 p = 0.02785
		No	29 (87.9%)	325 (76.0%)	354 (96.7%)	

the cases were reported in the age group of 5-10 years, which shows a shift in the prevalence of diphtheria cases from under 5 years to 5-10 years. Similarly, a studies conducted in central India and Indonesia have reported 55.32% of cases in the 5-12 years age group and 40.22% among the 5-9 age group.[1,10]

The majority of cases (76%) in the study were geographically reported from the blocks at the district boundary with to and fro migration in other states. The study in Europe has also highlighted the role of migration from the epidemic areas and by unvaccinated people leads to the spread of diphtheria across the different geographical regions.[9]

During a particular period, the rise of diphtheria cases may form a base for assuming several causes related to migration, epidemiological dynamics, etc. The present study has shown an increase in the number of cases during the August to December months. A study in Rajkot and Indonesia has also reported the rise in diphtheria cases from August to October and from September to December due to several environmental factors and seasonal changes making people more susceptible to infectious disease.[10,12] The talukas, which had reported more cases over the period, were border districts to Rajasthan State. The socio-cultural aspects and care-seeking behavior of these reported pockets should be the next level of assessment that can guide the health team for a local customized awareness campaign.

Immunization plays an influential role in preventing diphtheria in different countries, especially in developing countries like India. The study has shown half of the cases identified (55%) were aware of the immunization status or any vaccine taken during their lifetime. Three-fourths (77%) of cases have never taken the DPT 3 or Penta 3 vaccine. A study conducted at Hyderabad has reported vaccine efficacy among the population with three DPT doses (49%; 95% CI 0-80) and upto five DPT doses(91%, 95% CI 68-98) as compared with two DPT doses (0%, 95% CI 0-63).[4] A systemic review has suggested a 60% reduction in transmission of diphtheria among people if vaccinated with DPT 3 and interruption of transmission by 28% through vaccination among the outbreak settings.[11] In the study at Rajkot, 65% of identified cases have not received a single dose of DPT, revealing the importance of immunization status for reducing diphtheria cases.[12]

The study had few limitations as it is dependent on the records available with the district health team. The more constructive intensified surveillance activity with proper data collection format would yield better results for further analysis. However, this study showed that the characteristics of the cases identified have similar findings with other studies conducted in different parts of the world.

Conclusion:

The study concludes that most of the diphtheria cases were identified in 2019 at Banaskantha District. Diphtheria was more commonly identified among the age group of 5-10 years, during August to September months. The deaths were reported among the cases with no history of completed DPT or petavalent vaccine, in blocks located at the borders of Banaskantha District with frequent migration. These findings may be significant in designing a strategy to cover the maximum number of children for the diphtheria vaccine. Also, a structured database must be maintained for individual child regarding their vaccination status across their lifecycle to monitor the dropouts and left outs.

Recommendations:

The findings suggest that active screening and case findings of diphtheria among the community should be ensured through the meticulous follow up national guideline, surveillance of diphtheria, pertussis and neonatal tetanus. Immunization is essential for reducing diphtheria cases, so the efforts are to be made to cover the maximum number of children, especially in remote areas and who are frequently missed due to system side or beneficiary side reasons. A catch-up campaign for the vaccination should be scheduled for drop outs and left outs children to ensure at least three and booster doses of DPT or pentavalent vaccine. The staff should be provided refresher training of guideline; universal immunization program (UIP) guideline and district has to ensure that as per the guideline norms; a line

list for all eligible children up to aged 16 years for vaccination under UIP is to be maintained with their immunization status for effective vaccination coverage. Concentrated efforts are to be made to cover the migratory population sites and high-risk groups (settlements/hamlets/hard-to-reach areas) for diphtheria and vaccine-preventable diseases. A locally customized awareness campaign should be driven for those who don't have a clear vaccination history and push for social mobilization to ensure complete immunization as per the national immunization schedule norms.

Declaration:

Funding: Nil

Conflict of Interest: Nil

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Prevalence of Anxiety, Depression and Stress among Antenatal Women Attending a Tertiary Care Centre in Kerala during COVID-19 Pandemic

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Abstract:

Introduction: Anxiety, depression and stress can cause negative impacts on the foetus and pregnancy. The COVID-19 pandemic provides a unique stressor requiring an assessment of its impact in the Indian set up. **Objectives:** 1. To assess prevalence of anxiety and depression among antenatal women attending the antenatal OPD at a tertiary care centre during COVID-19 pandemic using Hospital Anxiety and Depression Scale (HADS). 2. To determine stress perceived by antenatal women using the Perceived Stress Scale (PSS). **Method:** Antenatal women attending the outpatient clinic between November 2020 and January 2021 were consecutively enrolled into the study after obtaining consent and a semi-structured interviewer administered questionnaire was used to collect data. The outcome variables, including sociodemographic details, HADS and PSS scores, were analysed using SPSS software, and results expressed appropriately, with quantitative variables expressed as mean and standard deviation, and qualitative variables as proportions. **Results:** Prevalence of anxiety among antenatal mothers was estimated to be 39%, of which 87.8 % had income below the poverty line. Prevalence of depression was estimated to be 11.4 %. Stress levels were high in 41.9 % of the women. Anxiety showed a positive correlation with stress (correlation coefficient of 0.711). **Conclusion:** High prevalence of anxiety and stress among antenatal women, especially from poor income backgrounds, points to an urgent need for reassurance and counselling.

Keywords: Antenatal, Anxiety, COVID-19, Depression, Pandemic, Stress

Introduction:

Pregnancy is a vulnerable time for both the mother and the baby and any psychological stressor during this period can have far reaching consequences. Sustained, elevated prenatal psychological distress increases the risk of perinatal depression, as well as prenatal infection and illness rates.[1]

Since the COVID-19 pandemic began in Wuhan[2] in late 2019, countries and governments have worked tirelessly to ensure the countering of the spread by issuing strict lockdown measures. All the restrictions in place, as well as the potential consequences of contracting the disease, have instilled a lot of worry among the general population, especially among pregnant women. A study in Canada[3] done in April 2020 found substantially elevated psychological distress compared to similar pre-pandemic pregnancy cohorts, with 37% reporting clinically relevant symptoms of

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Gomathy A, Indu D, Bindu N. Prevalence of Anxiety, Depression and Stress among Antenatal Women attending a Tertiary Care Centre in Kerala during COVID 19 pandemic. Healthline.2021; 12(4):54-60 .
	DOI : 10.51957/Healthline_270_2021	

depression, 57% reporting clinically relevant symptoms of anxiety, and 68% reporting elevated pregnancy-related anxiety. A study done in Ireland[4] shows over 35 % of pregnant women were self-isolating to avoid getting the disease. Almost half of women questioned (46.5 %; 33/71) altered their primary method of transportation. Bulk-buying was reported by many participants (66.2 % food, 42.3 % Hand sanitizer).

Hence although anxiety, depression and stress have been widely studied in the India[5,6] previously, the rising pandemic provides a unique stressor which requires a fresh look in the Indian set up. It is against this background, that this study was done to assess the burden of anxiety and depression among antenatal population attending a tertiary care hospital in Kerala, South India, with the goal of helping obstetricians, public health professionals and psychiatrists become better prepared for the effect of the pandemic on the mental health care set up.

The objectives of the study are:

1. To assess prevalence of anxiety and depression among antenatal women attending the antenatal Outpatient clinic (OP) at a tertiary care centre dedicated to maternal and child health care, during the COVID-19 pandemic, using Hospital Anxiety and Depression Scale (HADS).[7]

2. To determine stress perceived by antenatal women coming to the antenatal OPD during COVID-19 pandemic in terms of the Perceived Stress Scale (PSS).[8]

Method:

A hospital based cross sectional study was conducted in the antenatal OPD of a mother and child health care tertiary centre in Kerala, India. The study was done from November 2020 and January 2021, and all consecutive antenatal women who attended the antenatal OPD and consented to be in the study were included, while those who had a pre-existing psychiatric illness were excluded.

In a study done by Niloufer et al,[9] using the HADS questionnaire in a tertiary care setting, the prevalence of depression was found to be 49.7%. Applying this in the formula $4pq/d^2$ where 'p' is the prevalence of depression and 'd' is the relative precision of 20 %, the sample size was fixed as 105, after allowing a non-response rate of 5%.

A semi structured interviewer administered questionnaire was used to collect the data. The first part of the questionnaire dealt with sociodemographic details and medical history. The rest of the questionnaire comprised of the HADS scale [7] and Perceived Stress Scale.[8]

The Hospital Anxiety and Depression Scale (HADS) is a fourteen-item scale commonly used by doctors to determine the levels of anxiety and depression that a person is experiencing. Seven of the items relate to anxiety and seven relate to depression. Each item on the questionnaire is scored from 0-3 and a person can score between 0 and 21 for either anxiety or depression. A score between 0-7 is considered normal, 8-10 borderline abnormal (borderline case), and above 11 is considered as abnormal (case) as per the scale. The scale has been validated for use in Malayalam [10] and has also been validated for use in hospital, primary care, and general population.[11]

Stress perceived by the women was assessed using Perceived stress scale - a 10 item version. This scale comprises of 10 items with choices on a 5-point agreement scale. The questions were designed to tap the degree and frequency of stressful thoughts during previous one month. These questions are of general nature and can be applied to any subgroup of population. Perceived stress scale is reviewed as a questionnaire with good psychometric properties.[12]

The data was collected in MS excel spreadsheets, by directly uploading into a Google Form and analysed with SPSS software, version 25. The sociodemographic variables studied included the patients age, education level, husband's education

level, ration card colour, income per month, and occupation. The outcome variables included anxiety and depression scores using HADS scoring, stress scores using Perceived Stress Scale. Other variables studied included obstetric score, gestational age, and co morbidities. During the analysis, the participants were categorised as low (below poverty line) or high income (above poverty line) based on ration card colour. Yellow (most economically backward) and pink (below poverty line) ration cards were considered low income, and blue (nonpriority subsidy, above poverty line) and white cards (nonpriority) as high income. For the results, all quantitative variables were expressed in mean and standard deviation and all qualitative variables were expressed as proportions.

Ethical considerations: The study was undertaken after obtaining consent from the Institutional Human Ethics Committee.

Results:

The population studied had a mean age of 25.6 years ± 4.25 years, with the youngest being 19 years and oldest participant aged 36 years. Among the study population 13.33% had education up to high school, 34.3% up to higher secondary school and others degree and above. Very few were illiterate or studied up to primary school. Majority of the study subjects (86.7%) were home makers while 12.3% were skilled workers. The socioeconomic status was assessed based on their ration card and 81.1% belonged to BPL families.

The population studied had a mean gestational age of 30.3 weeks ± 7.0 with 67.6 % in the third trimester and 27.6% in the second trimester. The mean age of first conception was 23.0 years ± 3.28 with 43.8% being primigravidae. Regarding contact history with respect to COVID, 2.9% had contracted COVID-19 during the current pregnancy and were recovering from it, 3.9% had been secondary or primary contacts of lab confirmed COVID-19 positive patients and 86.7% had no history of COVID-19 or known contacts. The most common co morbidities seen were diabetes complicating pregnancy (14%), hypertension (13%) and thyroid problems (4.8%). (Table 1)

Table 1: Socio-demographic characteristics of study population (n=105)

Demographic variables		Number(%)
Age (years)	<20	10 (9.52%)
	21-25	47 (44.76%)
	26-30	32 (30.47%)
	31-35	12 (11.42%)
	>36	4 (3.81%)
Education	Husband	Wife
<SSLC	43 (40.95%)	15 (14.29%)
Upto plus 2	29 (27.62%)	36 (34.28%)
Diploma	9 (8.57%)	14 (13.33%)
UG degree	23 (21.9%)	36 (34.28%)
PG degree	1 (0.95%)	4 (3.81%)
Religion	Hindu	83 (79%)
	Christian	13 (12.4%)
	Muslim	9 (8.6%)
Type of family	Joint	2 (1.9%)
	Nuclear	87 (82.9%)
	Extended	2 (1.9%)
Income	BPL	86 (81.1%)
	APL	20 (18.9%)
Occupation	House wife	91 (86.7%)
	Unskilled worker	1 (1%)
	Skilled worker	13 (12.3%)
Gestational age	1st Trimester	5 (4.8%)
	2nd Trimester	29 (27.6%)
	3rd Trimester	71 (67.6%)
History of contact with COVID	Contracted COVID	3 (2.9%)
	From hot spot	2(2%)
	Health care worker	5 (4.8%)
	Contact of COVID patient	4 (3.9%)
	No history of contact	91 (86.7%)
Comorbidities	Diabetes	15 (14%)
	Hypertension	14 (13%)
	Thyroid disorders	5 (4.8%)
	Others	11 (10.4%)

Table 2: Relation between demographic variables and anxiety (n= 105)

Demographic variable	Anxiety		Chi square value	p value
	Yes n (%)	No n (%)		
Age (yrs)				
<30	32 (78.04%)	57 (89.06%)	20.34	0.236
> 30	9 (21.9%)	7 (10.93%)		
Income				
Below poverty line	36 (87.8%)	49 (76.6%)	4.336	0.502
Above poverty line	5 (12.2%)	15 (23.4%)		
Contact history				
No	35 (85.3%)	6 (87.5%)	3.86	0.696
Yes	6 (14.7%)	8 (2.5%)		
Occupation				
Unemployed	36(87.8%)	55 (85.5%)	3.497	0.321
Employed	5(12.2%)	9 (14.5%)		
Obstetric score				
Primigravidae	20(48.8%)	26 (40.6%)	0.675	0.411
Multigravida	20(51.2%)	38 (59.4%)		

Table 3: Relation between demographic variables and depression (n=105)

Demographic variable	Depression		Fischer's exact test value	p value
	Yes n (%)	No n (%)		
Age				
Age <30 yrs	9(75%)	80(86%)	16.17	0.328
Age >30 yrs	3(25%)	13 (14%)		
Contact history				
No	10 (83.3%)	81 (87.1%)	8.28	0.246
Yes	2 (16.7%)	12 (12.9%)		
Obstetric score				
Primigravida	5 (41.7%)	41 (44.1%)	0.025	0.874
Multigravida	7 (58.3%)	52 (55.9%)		

Prevalence of anxiety in the population (n=105) was 39% (n=41) of which 19% (n=20) were anxiety cases and 20% (n=21) borderline cases as per HADS. Among those who had higher than 7 scores on the anxiety scale, 75.6% were aged between 21 and 28 year, whereas only 2.4% were aged below 21 year and 22% were aged more than 28 years of age. However, the association between anxiety scores and age was not found to be significant (p> 0.05). (Table 2) Majority of anxious women (87.8%) belonged to Below Poverty Line category. No significant association was found between anxiety and socioeconomic status(p>0.05). (Table 2) Also, 85.3% of anxious women had no history of high-risk contact. There was no significant association between anxiety and history of contact with COVID-19. (Table 2)

Prevalence of depression was 11.4 % (n=12), of which 1% (n=1) was scored as depression case, and 10.4% (n=11) scored as borderline cases. In this study, 75% of those who were depressed were in the age group of 21-29 years. All the women who were depressed belonged to below poverty line category. Also, 83.3% had no high-risk contact. (Table 3)The mean score on the stress scale was 17.5 ± 1.029 and 41.9 % of the women scored higher than this mean score for the total population. Upon scoring for individual items on the stress scale, the highest mean scores were obtained for item 3 (mean score of 2.11 ± 1.24) and item 4 (mean score of 2.01 ± 1.04) of the Perceived Stress Scale, which tested how often the women felt like they were unable to control the things in their life, and how often they felt nervous and "stressed" respectively. Among those with stress, 11.5% were less than 20 years old, 75% were between 21 and 29 years and 13.6% were aged 30 and above. Majority of them (79.6%) were from lower income (Below Poverty Line) category and 84.1% had no history of COVID-19 or history of high-risk contact.

It was seen that 61 % of women with anxiety were in the third trimester, and 51.2% were primigravidae, whereas 50% of depressed women were in the first and second trimesters.

Higher anxiety scores correlated positively with higher stress scores (Spearman correlation coefficient of ± 0.717), with 46.5 % of women with anxiety having high stress scores as well.

Discussion:

The findings of this study corroborate with the findings of other studies done during the pandemic period, in Turkey,[13] Canada,[14] and Delhi[15] each of which found prevalence of anxiety to be 64.5%, 57%, and 9.8 %, and prevalence of depression to be 56.3%, 37% and 13.2% respectively. Also, there is an increase in the prevalence of anxiety when compared to a previous study done in the similar Southern Indian setting of Mysore, India during the pre-pandemic period, [16] which estimated the prevalence of antenatal anxiety to be 27%. It is also known that the pandemic brought multiple causes of worry, about not only the influences of the virus on the outcome of pregnancy, but also financial constraints. Indeed, a previous study done in coastal south India,[17] had estimated the prevalence of depression to 16.3 % with one of the reasons cited as being financial constraints. A similar finding is reflected by this study in the result that 87.8 % of anxious women had income that was below the poverty line.

It is also highly relevant to appreciate that the results of this study substantiate those of a review done in Malaysia [18] on the psychological impact of COVID-19 on antenatal women, which had found that the most common types of distress were anxiety and worry, followed by depression. The higher prevalence of anxiety as compared to depression in this study population also reflects this. Another interesting outcome from this study is that 85 % of anxious women also had no history of high-risk contact. In addition, higher anxiety scores also showed a positive correlation with higher stress scores. The participants also scored highest on questions that asked how often the women felt like they were unable to control the things in their life. This highlights the need to investigate factors causing high degrees of stress in the population and making

efforts to tackle these. It also supports evidence from other comparable studies conducted during this period, such as, the study by Nanjundaswamy, et al,[19] that concluded that the obstetricians mentioned the need for resources to help them manage anxieties among mothers and the need for training in simple counselling techniques.

Also, unlike most other comparable studies done in the same time period in which the questionnaires were administered online, in this study, the questionnaire was administered directly by the researcher, adding to the strength of the data collected as the effectiveness of face-to-face interviewing was utilised.

An important aspect of how psychological problems have been affected by the ongoing pandemic is reflected on how the prevalence varies with age groups. It was noted from the analysis that among those women with stress, 11.5% were less than 20 years old, 75% were between 21 and 29 years and 13.6% were aged 30 and above, and this is comparable to another study done in Mumbai,[20] which found that scores of Perceived Stress Scale, Patient Health Questionnaire (PHQ-9) and Generalized Anxiety Disorder (GAD-7) administered online in antenatal women in age group 21–30 years were higher than of women in the age group of 31–40 years. This could perhaps be reflective of the constant changes in the financial and social dynamics of this age group, contributing to increased levels of anxiety, and the need for targeting training in coping strategies in these women.

Conclusion:

This study concludes that antenatal women during the pandemic show a high prevalence of anxiety, more as compared to similar pre pandemic studies, and more as compared to the prevalence of depression. In addition, the subgroup of the population that was most anxious was those aged 21 to 29 years, and in the third trimester and from the lower socioeconomic class, even though the associations were not found to be statistically significant. In addition to substantiating the findings of similar studies done during the same period, a distinctive conclusion of this study is that high anxiety correlated with high stress, highlighting the need to pay specific attention to women who appear to be exceedingly stressed during this period.

Recommendations:

Screening of antenatal women for psychological problems must be given importance and these issues addressed at the earliest by appropriate interventions, such as counseling and treatment.

Declaration:

Funding: Nil

Conflict of Interest: Nil

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Knowledge and Beliefs about Organ Donation among Under-Graduate Medical Students at a Teaching Institute of New Delhi

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Abstract:

Introduction: Organ shortage is a global issue. As future doctors, role of medical students becomes important in promoting organ donation. **Objectives:** 1. To study the knowledge of medical students regarding organ donation 2. To study the beliefs of medical students regarding various aspects of organ donation 3.To study their perceptions about the need to have a training on this topic. **Method:** The study design was cross sectional involving undergraduate medical students from a teaching institute of Delhi. Sample size of 296 was calculated and 60 students were randomly recruited from each year by using random number tables. Data collection was done by using a pre designed pre tested semi structured questionnaire. Data entry and analysis was done by using Microsoft Excel and SPSS version 20 software. **Results:** A large proportion of 95.3% (286) had heard of 'organ donation' but correct knowledge regarding ideal age for donation and brain dead people for donation was very poor. It was significantly poorer in males and those studying in earlier years of graduation ($p<0.05$). A very small proportion (14.7%) had actually pledged for donation. A large proportion of students were in favour of providing health insurance and financial compensation for live organ donors. Only 27% perceived to have adequate knowledge and 58% felt confident in counselling potential donors for organ donation. Females and senior students were significantly better in this aspect. ($p< 0.05$). Majority of them (90.3%) felt the need for training. **Conclusion:** Knowledge and some of the beliefs of medical students regarding organ donation were not found to be appropriate and training about it was desired by them.

Keywords: Beliefs, Knowledge, Medical Students, Organ Donation, Training

Introduction:

Organ shortage is a global issue and there has been a huge gap between the demand and supply of organs for transplantation. Many countries are now focusing on increasing the number of organ donors as a part of their health policy agenda so that this shortage can be addressed. The magnitude of this problem is huge in India. It is estimated that in India, every year nearly 5 lakh people die because of the non-availability of organs. This shows the urgent need to focus on this issue.[1]

As future doctors, role of medical students becomes important in promoting organ donation. But it is seen that many of them lack the basic

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Priyanka, Rasania P, Kumar K, Rasania SK. Knowledge and Beliefs about Organ Donation among Under-Graduate Medical Students at a Teaching Institute of New Delhi. Healthline. 2021; 12(4): 61-67.
	DOI : 10.51957/Healthline_287_2021	

knowledge about the subject and are influenced by their personal attitudes and other biases held by the general public. Inadequate knowledge and competence to identify possible donors and counsel them for donation are important contributing factors which may be responsible for shortage of available organs. Previous research has shown various factors which prevent potential donors in becoming actual donors. Some of these include lack of awareness, religious and cultural beliefs and other misconceptions. The responsible factors should be found out and addressed in medical students so that they are in a better position to take a lead and motivate others for the same.[2-4]

The role of undergraduate medical curriculum is important in providing students with basic knowledge about procedures and ethical issues concerning organ transplantation and donation, which will help them in becoming informed advocates of organ donation.[5,6]

Objectives:

1. To study the knowledge of medical students regarding organ donation
2. To study the beliefs of medical students regarding various aspects of organ donation
3. To study their perceptions about the need to have a training on this topic.

Method:

The study design was cross sectional and study subjects included undergraduate medical students from a tertiary care teaching institute of Delhi.

For sample size calculation, estimated prevalence of knowledge about the concept of organ donation was taken as 74% from a similar previously done study on medical students.[7] Sample size was calculated by using the formula for single population proportion by assuming 95% confidence interval, sample error of 5% and prevalence of 74%. Sample size came out to be 296. It was decided to take equal number of students from each year (60/year) so that there is a proper representation from all the batches. The participants were randomly selected from each year by using random number tables.

Data collection was done by using a pre designed pre tested semi structured questionnaire containing questions about socio demographic characteristics of study subjects, various aspects of knowledge regarding organ donation and their beliefs regarding the same. Questions were also asked about their opinion about the need for training about this topic. Data entry and analysis was done by using Microsoft Excel and SPSS version 20 software. Quantitative data were expressed in means and standard deviations. For qualitative data, frequency and proportions were calculated. To test the association between different variables, chi square test was used. A p value of <0.05 was considered significant.

Ethical considerations

Permission to conduct the study was obtained from Institutional Ethics Committee. The participants were explained about the purpose of study at the time of enrolment and their written informed consent to participate was taken. All the data were kept anonymous and confidential.

Results:

The authors received a 100% response rate and all 300 participants were included in the final data analysis. The mean age of the participants was 19.3 years ±1.39 (range 17 to 24). The proportion of males was 63.7% and 60 (20%) participants each were enrolled from all the five years of MBBS.

Table 1 shows the knowledge of respondents about organ donation. Seven questions about knowledge were asked. A large proportion of 95.3% (286) had heard of 'organ donation' and out of those, 87.1% knew the actual meaning of it. A significantly large proportions of students from later years of course understood the meaning of the term as compared to those in earlier years ($p<0.05$). Among all, 81.7% correctly knew the time duration for

Table 1: Knowledge about organ donation according to gender and year of study

Correct knowledge about organ donation	Total (%) (n=286)	Gender			Year of MBBS					
		Male (n=183)	Female (n=103)	p value	Ist year (n=58)	Iind year (n=58)	IIIrd year (n=56)	IVth year (n=56)	Vth year (n=58)	p value
Know the meaning of "organ donation"	249 (87.1)	164 (89.6)	85 (82.5)	0.145	42 (72.4)	48 (82.8)	50 (89.3)	50 (89.3)	54 (93.1)	0.001
Time duration for viability of organs	245 (85.7)	152 (83.1)	93 (90.3)	0.216	47 (81.0)	53 (91.4)	45 (80.3)	49 (87.5)	51 (87.9)	0.394
Ideal age for organ donation	80 (28.0)	41 (22.4)	39 (37.9)	0.007	09 (15.5)	14 (24.1)	14 (25.0)	20 (35.7)	23 (39.7)	0.034
Brain dead person is ideal for organ donation	110 (38.5%)	59 (32.2)	51 (49.5)	0.005	14 (24.1)	20 (34.5)	21 (37.5)	26 (46.4)	28 (48.3)	0.068
Authority to give consent for organ donation	194 (67.8)	123 (67.2)	71 (68.9)	0.824	32 (55.2)	38 (65.5)	41 (73.2)	40 (71.4)	43 (74.1)	0.127
Aware of Transplantation of Human organs Act	90 (31.5)	57 (31.1)	33 (32.0)	0.930	09 (15.5)	17 (29.3)	18 (32.1)	22 (39.3)	24 (41.4)	0.018

viability of organs. A slightly more than one fourth (28%) and one third (38.5%) participants correctly knew that people of all age groups and those who are brain dead are ideal for organ donation respectively. This knowledge was significantly higher in females ($p<0.05$). Almost two third (67.8%) subjects knew that only donor is the authority to give consent for organ donation while only 31.5% were aware of Transplantation of Human organs Act, the level of awareness being significantly higher in those studying in later years of MBBS.

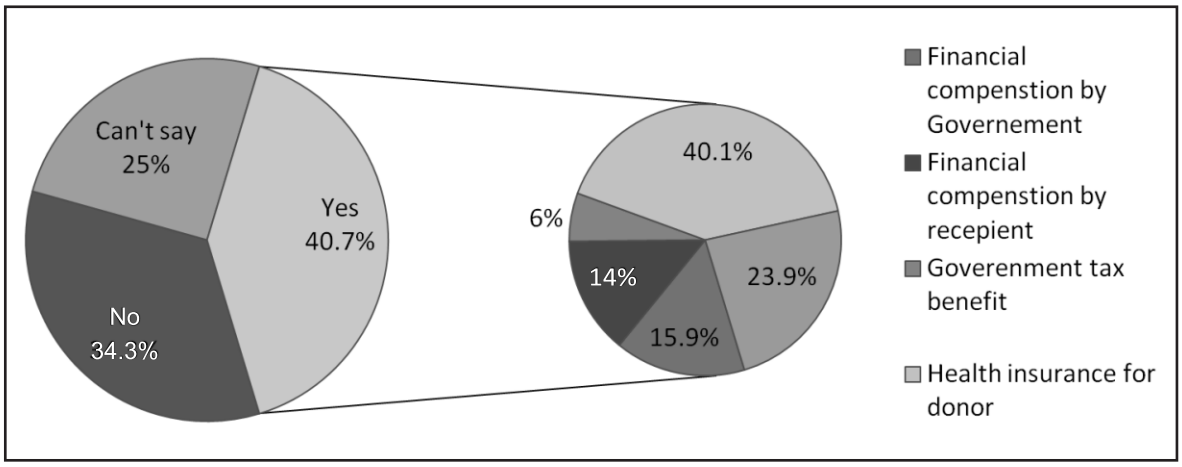
Respondents were also asked regarding their beliefs about organ donation. Almost 40% (122) felt that live donors should be compensated. A significantly larger proportion of students from later years of MBBS were in favour of compensation as compared to those in earlier years ($p>0.05$). Out of these 122, 40% were in favour of provision of health insurance to the donor. Almost one third believed that donor should be financially compensated, by Government (14%) or by recipient (15.9%). A small proportion (6%) believed that donors should get some tax benefit from the Government. (Figure 1)

A large majority (89.7%) believed that organ donation is a noble act which is useful for society. Only 16% believed that religion is against organ donation. Although a majority of them (88.3%) were in favour of organ donation but only 14.7% had actually pledged for it. In all these aspects, the responses from female students were more favourable than males and this difference was found to be statistically significant ($p<0.05$).No significant difference regarding these was observed among students from different years of study.

Table 2: Belief and practices of respondents about organ donation

Belief / Practices	Total (%) (n=300)	Gender			Year of MBBS					
		Male (n=191)	Female (n=109)	p value	Ist year (n=60)	IInd year (n=60)	IIIrd year (n=60)	IVth year (n=60)	Vth year (n=60)	p value
Donor should be compensated	122 (40.7)	82 (42.9)	40 (36.7)	**0.415**	17 (28.3)	18 (30.0)	25 (41.7)	25 (41.7)	37 (61.7)	**0.007**
Organ donation is noble act and useful for society	269 (89.7)	166 (86.9)	103 (94.5)	**0.038**	54 (90.0)	50 (83.3)	56 (93.3)	55 (91.7)	54 (90.0)	**0.781**
Religion is against organ donation	48 (16.0)	37 (19.4)	11 (10.1)	**0.034**	08 (13.3)	09 (15.0)	11 (18.3)	11 (18.3)	09 1(5.0)	**0.452**
In favour of organ donation	265 (88.3)	168 (87.9)	103 (94.5)	**0.012**	51 (85.0)	57 (95.0)	50 (83.3)	56 (93.3)	51 (85.0)	**0.249**
Taken pledge for organ donatio	44 (14.7)	18 (9.4)	26 (23.9)	**0.001**	13 (21.7)	09 (15.0)	09 (15.0)	07 (11.7)	06 (10.0)	**0.429**

Figure 1: Respondents' opinion about compensation for live organ donors and type of compensation



Only 27% respondents opined that they have adequate knowledge to educate people about organ donation while 58% felt confident in counselling people about this issue. Although there was no significant difference in knowledge among both genders but a significantly larger proportion of females reported to have confidence in counselling patients ($p<0.05$). Students from later years of MBBS were better than those from earlier years with regard to both these aspects ($p<0.05$). A large proportion (70%) perceived that MBBS curriculum is an important source of information about organ donation with a significantly better response from females ($p<0.05$). A majority of them (90.3%) felt

Table 3: Opinion of respondents on issues related to training on organ donation

Opinion	Total (%) (n=300)	Gender			Year of MBBS					
		Male (n=191)	Female (n=109)	p value	Ist year (n=60)	Iind year (n=60)	IIIrd year (n=60)	IVth year (n=60)	Vth year (n=60)	p value
Have adequate knowledge to educate others about organ donation	81 (27.0)	53 (27.7)	28 (25.7)	>0.05	09 (15.0)	13 (21.7)	17 (28.3)	19 (31.7)	23 (38.3)	<0.05
Have confidence in counselling patients for organ donation	174 (58.0%)	99 (51.8)	75 (68.8)	<0.05	25 (41.7)	28 (46.7)	32 (53.3)	39 (65.0)	50 (83.3)	<0.05
Perceive MBBS curriculum as an important source of information about organ donation	210 (70.0)	117 (61.3)	83 (76.1)	<0.05	39 (65.0)	43 (71.7)	41 (68.3)	41 (68.3)	46 (76.7)	>0.05
Feel the need for training on organ donation	271 (90.3)	175 (91.6)	96 (88.1)	>0.05	56 (93.3)	53 (88.3)	55 (91.7)	53 (88.3)	54 (90.0)	>0.05

that they need training on this topic. There was no statistically significant difference among both genders and different years of study. (Table 3)

Discussion:

The present study shows that the overall knowledge about organ donation was poor among medical students. Although 95.3% had heard of 'organ donation' but out of these, 83% knew the actual meaning of it. A study by Dibaba FK on medical students in Ethiopia also shows that 97% had heard the term but 74% knew the meaning of organ donation.[7] In this study, only 36.7% knew that brain dead persons are ideal for organ donation. This proportion was higher in similar studies on medical students in India where it was found to be between 50% to 92%.[8,9] Gupta RK et al have shown that 97% participants knew that donor has the authority to give consent for organ donation.[4] Knowledge regarding this aspect was found to be poorer in the present study (64.7%). The proportion of students who were aware of Transplantation of Human organs Act was only 30% as compared to 42% reported by similar study done by Jose A et al and 81% reported by Gupta RK et al.[4,8] It was found that in certain aspects, knowledge was significantly higher in females and those studying in later years of medical course. These findings are in accordance with other similar studies.[2,4,10-12]

In this study, 40% respondents were in favour of compensation for the donor, which mainly includes tax benefits and financial benefit from Government or recipient. This shows that they believed that donors should be acknowledged for their kind act. Jose A et al also reported that 46% students were in

favour of monetary compensation for the organ donor.[8] A large proportion of subjects (84%) believed that religion is in favour of organ donation. These results are similar to other studies.[7] Although a majority of them (88.3%) were in support of organ donation but only 14.7% had actually pledged for it. This reflects a major gap in attitude and practices of study subjects. Other authors have also reported that most of subjects support donation but a small proportion have actually pledged.[2-6,12-15] Studies conducted by Alex P et al as well as by Darlington D et al have shown that female students were significantly more supportive for organ donation.[10,11] This is in accordance with findings of present study. Another study from Ethiopian medical students shows a more positive attitude of males towards organ donation.[7] Results of a study by Demirag S shows that students from senior years of graduation were more in favour of organ donation.[15]

A very large proportion of study subjects (73%) felt that they don't have adequate knowledge to educate people while 42% were not confident in counselling people about organ donation. Chung CKY et al have reported that almost 30% students felt confidence in counselling about this topic and students from senior batches were more confident.[2] Other authors have reported that almost 80% students felt comfortable to talk to others about organ donation.[6,7] In this study, 70% study subjects perceived medical curriculum as an important source of information about organ donation. Other studies have shown that only 16% students considered the adequacy of medical curriculum in educating about this issue.[2] A majority of study subjects from all the years and both sexes felt the need for training. Similar finding have been shown by many other authors.[2,4,6,9,12,16] Some other studies have also reported that students feel that formal education about organ donation should be a part of medical curriculum.[5,6] Thus, there should be more emphasis on this aspect in medical curriculum which can sensitize medical students who will become future doctors. Research has shown that exposure to an elective course on organ donation among medical students resulted in a favourable change in their knowledge and attitude about the same.[17,18] Hence, a similar sensitization during MBBS course may improve awareness, attitudes and competence of medical students which is well desired and felt by students also.

Conclusion:

A large proportion of 95.3% (286) had heard of 'organ donation' but out of those, 87.1% knew the actual meaning of it. correct knowledge regarding ideal age for donation and ideal candidates for organ donation was very poor. It was significantly poorer in males and those studying in earlier years of graduation ($p<0.05$). A majority of subjects believed that organ donation is a noble act and were in favour of it, but only a very small proportion (14.7%) had actually pledged for it. A large proportion of students were in favour of providing health insurance and financial compensation for live organ donors. Only a small proportion (27%) perceived to have adequate knowledge and only 58% felt confident in counselling potential donors for organ donation. Females and senior students were significantly better in this aspect. ($p< 0.05$). Majority of them (90.3%) felt the need for training.

Declaration:

Funding: Nil

Conflict of Interest: Nil

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Use of Physical Activity Module as an Intervention to Enhance Knowledge among High School Children – A Pilot Study

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Abstract:

Introduction: Among children, one of the most serious public health challenges of the 21st century is childhood obesity, namely central obesity. This increases the risk of cardiovascular disease and diabetes. Studies show that, children who are physically active are less likely to have central obesity making it a key element in the prevention and treatment of both chronic diseases. **Objectives:** To assess the baseline knowledge and post-interventional knowledge of the students and teachers on the physical activity; to assess the utility and acceptability of the intervention module. **Method:** An interventional study in 2 schools by administering tests prior to and after giving a class on the importance of physical activity and focused group discussion with teachers to assess the utility and acceptability of intervention. Data analysed using SPSS software, tabulated and interpreted by applying statistical tests. **Results:** Among the 120 students who participated, a significant increase in knowledge regarding the need for physical activity after health education was observed. **Conclusion:** Health education approach in schools was found to be effective and feasible in improving the knowledge and behavioural practices regarding physical activity among adolescents to reduce childhood obesity and to improve overall health.

Keywords: Adolescents, Health, Obesity, Physical Activity

Introduction:

Among children, one of the most serious public health challenges of the 21st century is childhood obesity, particularly the urban settings.[1] Worldwide, in 2016 the number of overweight children under the age of five was estimated to be over 41 million.[2] Many children today are overweight or obese than ever before. "Overweight" means that the individual weighs more than what is recommended for a given height.[3,4] "Obesity" is an excess of body fat and central (abdominal) body fat is linked to cardiovascular disease and diabetes.[5,6] Studies examining the relationship between physical activity and abdominal fat suggest that those who are more active are less likely to have central obesity.[7] Lack of physical activity is one of the main factor contributing to the rise of the childhood obesity crisis.[8] Children who embrace healthy eating and exercise habits during middle childhood will have a much easier time maintaining a healthy lifestyle

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Modi B, Chavda M, Prajapati J, Prajapati D, Bavarva NR, Mehta P, et al. Use of Physical Activity Module as an Intervention to Enhance Knowledge among High School Children –A Pilot Study. Healthline. 2021; 12(4):68-73 .
	DOI : 10.51957/Healthline_248_2021	

through adolescence and adulthood than individuals who try to make the shift later in life.[9] Thus promoting physical activity in children may lead to a healthy lifestyle in adulthood and further help in reducing the burden of chronic diseases.[10] Schools are probably an ideal medium for intervention as they are central to children's lives and relatively quick dissipation of information can occur through this channel.[11]

Life skills "can help people to make informed decisions, communicate effectively and develop coping and self-management skills that may help an individual to lead a healthy and productive life." These skills are often taught to adolescents, as they can help them successfully transition "from childhood to adulthood by healthy development of social and emotional skills." So, the Indian Association of Preventive and Social Medicine (IAPSM) came up with an idea of bringing in a comprehensive education module which will deal with the students in their early age to understand their own and their family health so that the overall healthy behaviours are incorporated into the individual from their growing age by itself. LEAP (Life Skills Education and Health Promotion)module was created by IAPSM-REECH team consists of around 100 contributors from various parts of the country. The ideas of different people are put across in a single SOP (Standard Operating Procedure) to make a common content on nutrition, physical activity, common illness (malaria, tuberculosis, obesityetc.), stress and depression etc. The LEAP covers all 4 objectives of RKSK through school health component.

Therefore, present study was conducted among children and teachers with below mentioned objectives.

1. To assess the baseline & post interventional knowledge of the students & Teachers on Physical activity
2. To assess the utility and acceptability of the intervention module

Method:

An interventional study was done among students of class 8th or 9th of two schools(a CBSE and a state syllabus school)which were selected using convenience sampling technique for 6 months. Selection of the participants was done by cluster randomization. Permission from the school, consent from parents and assent from students were obtained. For keeping power of study at 80% and number of clusters being 2, with considering intra cluster correlation coefficient at 0.03, and expecting a change by 4 times with base knowledge to be 50% the total sample size 50. Adding the 20% non-response in this will give a final sample size of 60 and 30 in each cluster.

The total teaching hours of the module was divided and spread over 3 months with consensus with the teachers. The physical activity module for adolescents was introduced in vicinity of the teachers and the teachers were given a hard copy of the module (one copy per school) and were requested to learn the same. A validated pre-tested pre-test questionnaire (having mutiple choice questions) was administered to the students in order to assess their knowledge of physical activity (likes various types, duration of physical activityetc.), benefits of physical activity, health hazards caused by physical inactivity The knowledge of students and teachers were re-tested by administering the questionnaire formerly used after 3 months. A validated and pre-tested general questionnaire on acceptability and utility of the module was also introduced to the students and teachers. Teachers were also introduced with a questionnaire to assess their willingness and the difficulty to undertake the module. Two Focused Group Discussion (FGD) for teachers of both the schools were conducted to get more inputs on the module which included 6 teachers per group and the discussions were tape-recorded, transcribed and analysed accordingly.

The data were entered in Microsoft Excel and analysed using SPSS 16. Frequency and percentage were calculated for test scores. To test the association

between utility and a change in knowledge chi-square test was used. To assess the difference in knowledge between pre-test and post-test, the difference in knowledge was graded wherein a score >5 was considered to be good while a score of 3-5 was awarded an average grade. Difficulty index of the module was also assessed and the scoring option given ranged from 1 to 10, wherein 1 stood for module being easy while a score of 10 was considered difficult to understand.

Results:

A total of 120 students were enrolled for the study from two English medium schools- a CBSE syllabus (school 1) and a state syllabus (school 2). Out of 120, 80 were from school 1 and 40 belonged to school 2. On assessing the basic awareness regarding the importance of health among the students, it was observed that 70% of the students in school 1 and 48% of students in school 2 had strongly agreed that understanding the need for physical activity is good for them. While 69% of the students in school 1 and 73% of students in school 2 strongly agreed that they think health is important for all. Only 30% of students in school 1 and 25% of students in school 2 strongly agreed that knowing health-related issues will make them a better person.

On an assessment of awareness regarding understanding the need for physical activity among teachers, it was observed that 100% of them strongly agreed to it. Cent percent of the teachers strongly agreed that as a teacher they need to know more about health-related issues and that health is important for all. Following the health education, all the teachers strongly agreed that they are aware of health hazards due to lack of physical health activity. On comparing the results of pre-test and post-test, it

Table 1: Distribution of knowledge regarding physical activity, its benefits and health hazards caused by physical inactivity prior to and after health education class among students

Knowledge	School 1 (n=80)		School 2 (n=40)	
	Before class n(%)	After class n(%)	Before class n(%)	After class n(%)
Regarding physical activity	75(93.75)	80(100)	23(57.5)	40(100)
Regarding benefits of physical activity	55(69)	71(89)	4(10)	38(95)
Regarding health hazards caused by physical inactivity	28(35)	56(70)	14(35)	35(87)

Table 2: Knowledge of physical activity, sleep and posture prior to and after health education class

Knowledge	School 1 (n=80)		School 2 (n=40)	
	Pre test n(%)	Post test n(%)	Pre test n(%)	Post test n(%)
Recommended duration of physical activity	28(35)	64(80)	6(15)	40(100)
Recommended level physical activity	31(39)	62(77)	8(20)	40(100)
Moderate aerobic exercise in children	8(10)	13(16)	3(8)	33(83)
Sleep	28(35)	77(96)	14(35)	35(88)
Posture	79(98)	80(100)	33(82)	40(100)

Table 3: Association of acceptability and utility of the module with the change in knowledge School 1 (n= 80) and School 2 (n =40)

Variables		Increase in Knowledge – School 1				Increase in Knowledge – School 2			
		Average	Good	Total	p-value*	Average	Good	Total	p-value*
Understanding physical health is good	Neutral	1(2%)	1(4%)	2	0.113				0.973
	Agree	9(16%)	9(36%)	18		6(35%)	8(35%)	14	
	Strongly agree	45(82%)	15(60%)	60		11(65%)	15(65%)	26	
The utility of teaching methods is good	Neutral	4(7%)	4(11%)	8	0.133				0.012
	Agree	12(22%)	9(24%)	21		5(29%)	16(70%)		
	Strongly agree	39(71%)	25(65%)	51		12(71%)	7(30%)		
The module was easy to understand	Disagree	0(0%)	1(5%0	1	0.201	1(6%)	1(4%)	2	0.755
	Neutral	13(26%)	9(45%)	22		4(24%)	9(39%)	13	
	Agree	20(37%)	5(25%)	25		9(53%)	9(39%)	18	
	Strongly agree	20(37%)	5(25%)	25		3(17%)	4(18%)	7	
Post education awareness improved	Strongly disagree	1(2%)	0(0%)	1	0.006				0.262
	Disagree	4(7%)	2(8%)	6		4(24%)	3(13%)	7	
	Neutral	1(2%)	5(20%)	6		2(12%)	9(39%)	11	
	Agree	16(29%)	12(48%)	28		7(40%)	8(35%)	15	
	Strongly agree	33(60%)	6(24%)	39		4(24%)	3(13%)	7	
Difficulty index value (1-10)	1	23(42%)	8(32%)	31	0.861	8(47%)	1(4%)	9	0.027
	2	14(25%)	8(32%)	22		1(6%)	1(4%)	2	
	3	12(22%)	6(24%)	18		3(18%)	7(31%)	10	
	4	6(11%)	3(12%)	9		4(23%)	9(39%)	13	

*(p value was calculated by chi square test.)

was observed that there was an increase in knowledge regarding the types of physical activity, benefits of physical activity, and the ill effects of physical inactivity .

On comparing the pre-test and post-test scores, an increase in knowledge was noted after the administration of health education class regarding the duration of physical activity, level of physical activity that is required for the adolescent age groups (Table 1).

The students showed an improvement in the post-test regarding knowledge about the requirement and benefits of sleep and also regarding the posture and its benefits (Table 2).

A paired-sample t-test was conducted to compare the mean difference in scores of pre-test and post-test in school 1 and school 2. There was a significant difference was observed in the scores of school 1 (Mean =3.2, Standard Deviation=0.88) and school 2 (Mean=10.17, Standard Deviation=1.81) as well.

When the association between acceptability and utility of the module and the change in knowledge of the students and teachers were assessed it was seen that there was no significant association between the change in knowledge and acceptability and utility of the module, although the participants agreed that the module was good for understanding the need for physical activity among adolescents. (Table 3)

Discussion:

The school setting has long been defined as the ideal setting for physical activity promotion interventions. Physical activity can help kids cope with stress and it also promotes healthy growth and development, better self-esteem, stronger bones, muscles and joints, better posture and balance, better focus and concentration during school.[12] Since adolescence is the age group where a healthy habit can be promoted which can benefit the individual in the future, a special interest should be taken to provide the right education regarding the need for physical activity and other health-related issues. In this study, which was conducted in school, it was found that the majority of students strongly agreed that the understanding regarding the need for physical activity was good for them. Students and teachers also agreed that teachers need to know more about health-related issues. Esther M F et al in their study concluded that multicomponent interventions and interventions including school and family or community involvement may make important differences in physical activity levels in adolescents.[13] It was evident in this study that intervention with health education showed a significant increase in knowledge among students. Structured physical activity programming can improve psycho-social outcomes such as self-concept, social behaviours, goal orientation, and most notably self-efficacy. Henceforth, it can be said that a properly structured health education modules can certainly make an impact on the knowledge and behaviour among adolescents as in this study

Conclusion:

In schools, health education approach was found to be effective and feasible in improving the knowledge and behavioural practices among adolescents to reduce childhood obesity and to improve overall health. There was a significant increase in knowledge regarding the need for physical activity among students. Although there was no statistically significant association between the utility of module and knowledge, overall there was a positive impact considering the knowledge acquired by students from the module.

Declaration:

Funding: Nil

Conflict of interest: Nil

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Profile and Career Decisions of First Year Medical Students Studying at a College Located in western India

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Abstract:

Introduction: The attitude of the students and the reasons for choosing a career, medicine in particular are of importance as input for educators to create a medical graduate. **Objectives :** To get an account of medical students' reasons for choosing medicine and to document qualities of a good doctor as perceived by them. **Method:** Cross-sectional study was conducted through self-administered & semi-structured questionnaire in August 2019, at a government run Medical College of India to a batch of 200 students. **Results :** Majority of students were involved in some kind of sports. Honesty, good communication skills, desire to serve humanity, patience were qualities of good doctor quoted by majority of them while compassion, empathy, clinical acumen was mentioned by less than half of them. Majority of them listed self-interest or passion as the predominant reason to choose medicine as a career. A fifth of the students mentioned influence of Family or Parents as reasons to join the course. **Conclusion :** Compassion, empathy, Clinical acumen as qualities of a good doctor was mentioned by less than half of them. During the one month foundation program and professionalism modules the areas identified can be stressed upon.

Keywords: Career Choices, Leisure Activities, Medical Schools,Physician's Role

Introduction:

Medical profession is one of the most highly rated professions due to the fact that it offers prospects of a financially as well as a socially satisfying career. The attitude of the students and the reasons for choosing a particular career are of great importance for policy makers around the world.[1,2] The students have a number of career choices and it becomes difficult for them to choose a particular career when they are unsure. They are selected through an all-India entrance test in the form of National Eligibility cum Entrance Test (NEET), after successful completion of twelve years of schooling. NEET is MCQ based test offered in twelve Indian languages. This involves four and half years of study in a medical college followed by one year of internship. Upon completion of Undergraduate degree, one is expected to be a competent primary care physician. Medical profession requires hard work; endure lengthier periods of training both at undergraduate and postgraduate level, compromise personal and family time and dedication for lifelong learning. It is observed that many students in India prefer a career in medicine because of parental pressure and might be in need of counselling/ support sessions. The present study was conducted to get an account of their reasons for choosing medicine; to document qualities of a good doctor as

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Misra S, Fichadiya N. Profile and Career Decisions of first year Medical Students studying at a College located in western India. Healthline. 2021; 12(4) : 74-77.
	DOI : 10.51957/Healthline_238_2021	

perceived by them; and to document their perceived health at the time of data collection.

Method :

A month-long foundation program[3] commenced on 1st of August 2019, at a government run Medical College located in western India. A batch of 200 students; 56 (28%) females and 144 (72%) males, from all medium of instructions, took admission to the first professional course of MBBS, through an all-India entrance test in the form of National Eligibility cum Entrance Test (NEET), after successful completion of twelve years of schooling. This is a cross-sectional study conducted through a self-administered & semi- structured questionnaire. The same was designed and pilot tested that identified student's socioeconomic background, reasons for choosing medicine, qualities of a good doctor as perceived by them and to document their perceived health at the time of interview. The data was entered in MS excel 2016 and descriptive statistics viz; percentages (%) and Mean were applied. Prior approval from the nodal officer of the foundation program was obtained. An informed verbal consent was obtained from the students and the inclusion was voluntary/participatory.

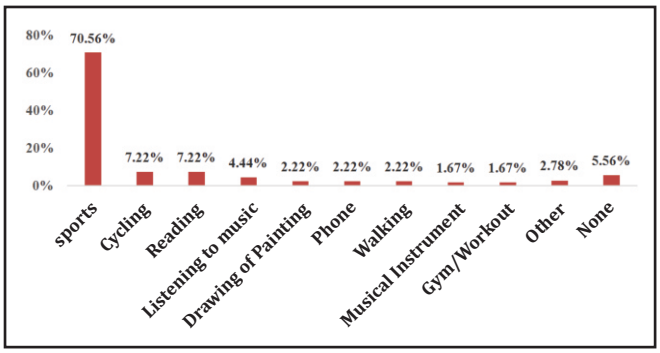
Results :

Out of the 200 students who took admission, 180 (90 %) were present to fill the questionnaire. The mean age of students was 17.59 ± 0.65 years (95% Confidence Interval (CI); 16.29-18.89). Around 56.67% belonged to a joint family system, two from broken family, one did not answer and the rest were from nuclear family. Only 42.7% replied to their medium of instruction of which 85% were from English medium. Students from vernacular language (Hindi or Gujarati) did not reply to this question. Seventy-three percent of them resided in hostels, 20% were from the city and rest took a rented living. Mean Monthly Income (N=169) of the family was Rs. 35762 (Range; 1,000 - 6,00,000, Median; 20000, No answer= 11). In almost half of the students, father (60%) or mother (50%) had college education. 23% fathers and 10% mothers were professional degree holders. It was also noted that in 8.66% students, either father or mother was a doctor, in 5.5% both parents and in 2% other family member was a doctor. None of the study subject was married.

Addictions and Health Status : To the question on addiction, 15 % did not reply. Of those who replied only one confessed of smoking cigarettes, three other forms of tobacco (padiki) and the rest replied in negative. Of those who (123) could recall their heights measured in past one year; the mean height was 167.95 ± 11cms (95% CI; 145.95-189.95). And of those who (167) could recall their weights measured in past one year; the mean weight was 60.17 ± 13.41Kgs (95% CI; 33.35- 86.99). Two thirds (122) could calculate their Body Mass Index (BMI) after explanation and Mean BMI was 21.40 ± 4 (95% CI; 13.40-29.40). The mean Hb of those who responded (82)and was conducted within past two years was 13.12 ± 2 ((95% CI; 9.12-17.12). Almost eighty-nine percent of them perceived their current health status to be good, 10.5% did not answer and one of them perceived it to be bad.

Majority of the students (70.5%) were involved in some kind of sports during their leisure time. 7.2% of each took to cycling and reading. Listening to music and other ways of leisure time activities are shown in Figure 1. It was found that 5.5% were not interested in any leisure time activity.

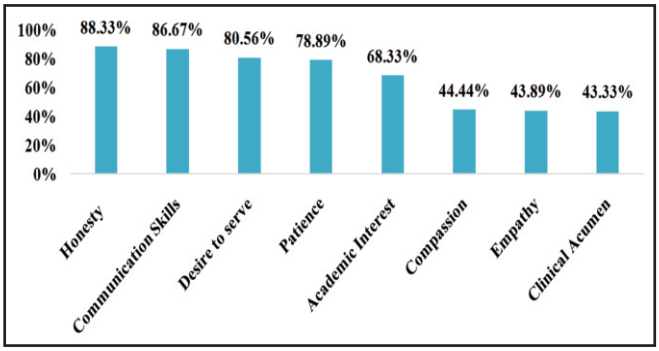
Figure 1: Students' involvement in Leisure Time Activity



Honesty, good communication skills, desires to serve the humanity, patience were qualities of a good

doctor as quoted by majority of the students. Other qualities mentioned were; academic interest, compassion, empathy and clinical acumen as shown in Figure 2.

Figure 2: Qualities of a Good Doctor as perceived by the Students



Majority of the students listed self-interest or passion as the predominant/primary reason to choose medicine as a career. One third of them mentioned service to community, followed by influence of family or parents, research opportunities, earning potential, prestige, financial security and others as shown in Table 1.

Table 1: Reasons for choosing Medicine as a career option

Reason for Choosing Medicine (Multiple Answer)	N (%)
Self Interest or Passion	137 (76.11%)
Service to Community	53 (29.44%)
Influence of Family or Parents	35 (19.44%)
Research opportunities	35 (19.44%)
Earning potential	31(17.22%)
Prestige	30 (16.67%)
Financial Security	25 (13.89%)
Doctor - Patient relationship	23 (12.78%)
Intellectual Stimulation and challenge	19 (10.56%)
Influence of Role Model	16 (8.89%)
Availability of training opportunities	12 (6.67%)
Ability to pursue non- work- related interests	8 (4.44%)
Influence of a mentor	7 (3.89%)
Teaching opportunities	7 (3.89%)
Workload Flexibility or Predictability	6 (3.33%)
Others	3 (1.67%)

Discussion :

The most common reason of opting for medical profession was self- interest or passion in the present study, a finding similar to study by Rani et al [4] from India where passion was the major motivational factor for choosing medical profession as career. Lal et al in India [5], Harth et al[6] in Australia, Razali et al [7] in Malasyia and Perara et al[8] in Sri Lanka also found similar reasons for entering medical school in their study. In studies from India by Lal et al [5] and Tiwari et al [9] main reason for joining medical career was the interest in service to humanity whereas in the present study in majority of the students it was self-interest or passion followed by service to the community. A fifth of the students were influenced by parents or family that determined their career choice, similar findings are quoted by Lal et al. [5] In a qualitative study by Wouters et al [10] conducted in dutch high school students pursuing a medical career pertained to autonomous motivation (interest in science and helping people), but controlled motivation (e.g. parental pressure, prestige) was also mentioned, a finding similar to current study.

Present study is one of its kind where we also explored self-perceived opinion related to health and leisure time activities. Majority of the students (70.5%) were involved in some kind of sports during their leisure time, pursued varied interest and recalled their height, weight and Hb level. The foundation Program in the Graduate Medical Regulations, 2018 (GMR)[3] has explicitly incorporated sports as one of the six modules viz; Orientation, Skills, Community orientation, Professionalism & ethics, Enhancement of language, computer skills, Sports and Extracurricular activities.

The study also tried to enlist qualities of a good doctor as part of professional attitude where honesty, good communication skills, desire to serve the humanity, patience were as quoted by majority of the students. The Graduate Medical Regulations, 2018 (GMR) mentions one of the roles of an "Indian

Medical Graduate" (IMG) as; communicator.[11] In order to ensure that training is in alignment with the goals and competencies, Medical Council of India (MCI) has designed a structured longitudinal programme on attitude, ethics and communication in form of AETCOM module.[12]

Conclusion :

A fifth of the students mentioned influence of Family or Parents as reasons to join the course. Honesty, good communication skills, desire to serve humanity, patience were qualities of good doctor quoted by majority of them while compassion, empathy, clinical acumen was mentioned by less than half of them. Majority of them listed self-interest or passion as the predominant reason to choose medicine as a career. During the one month foundation program and professionalism modules the areas identified can be stressed upon.

Recommendations : A follow-up study of the same cohort after final MBBS exam (four & half years) on perceptions, performance and health status of the same students can be taken up.

Limitations :

One of the limitations of this study is that it evaluated single medical school, which may not represent the "Indian Medical Graduate" as a whole. The data is based on recall; hence some sort of biases could not be minimized. Therefore, caution should of course be exercised in extrapolating results to all students in all medical schools.

Declaration :

Funding: Nil

Conflict of Interest: Nil

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Challenges in Menstrual Hygiene Practices among Urban and Rural Women (Aged 15-45 Years) of District Pali in Western Rajasthan

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Abstract:

Introduction: In India, even today regressive socio-cultural norms pertaining to menstruation continue to thrive in many parts. The government in Rajasthan has been distributing sanitary napkins to girls in the age group 10-19 years through the Education & ICDS department since 2018. This study assesses utilization and acceptance of the sanitary pads distributed frees of cost among adolescents and at a nominal rate to women and identifies the challenges in observing menstrual hygiene practices in semi arid areas. **Method:** A cross-sectional study was conducted among women aged 15-45 years in six urban wards and six sub- centre villages under the Rural Health and training Centre(RHTC) Gundoj. Keeping power of study at 80% adding the 10% non-response, 50% prevalence for hygienic menstrual practices, a sample size of 384 participants was taken, 192 each from rural and urban areas with 50% of the participants being school going girls. **Results:** Among school going participants, 184 (95.8%) in urban areas and 169(88%) were utilizing the free sanitary pads distributed in schools, rest used locally purchased "red cloth". Average level of hygiene practices was comparatively more among urban participants, 173(90%) than rural women 77(40.1%) (p value<0.05).During menstruation performing religious activities, doing idol worship, eating and drinking water with family was taboo among 92% of both urban and rural respondents. **Conclusion:** Distribution of sanitary pads in schools is a successful intervention in Pali District. However, knowledge of healthy menstrual hygiene practices was low (23%) among rural women. Disposal of used pads and attitude towards social taboos need to be addressed in the rural areas of the district with better convergence between Education, ICDS and Health department for advocacy of healthy menstrual hygiene practices.

Keywords: Hygiene, Menstrual hygiene, Sanitary pads, Taboos

Introduction:

In India, even today regressive socio-cultural norms pertaining to menstruation continue to thrive in many parts. UNICEF and the WHO define Menstrual Hygiene Management as "Women using a clean menstrual management material to absorb or collect blood.[1] Menstrual hygiene management also involves addressing harmful societal beliefs and taboos surrounding the issue.[1] Menstrual taboos are deeply rooted and contribute to gender inequality. Globally, 663 million people lack access to safe water and 2.4 billion people lack access to adequate

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Sinha LN, Choudhary S, Bhati B, Mewara R, Deep A. Challenges in Menstrual Hygiene Practices among Urban and Rural Women (Aged 15-45 Years) of District Pali in Western Rajasthan. Healthline.2021; 12(4):78-83 .
	DOI : 10.51957/Healthline_261_2021	

sanitation.[2] Water, Sanitation and Hand Hygiene (WASH) services are vital for effective Menstrual Hygiene Management (MHM).[2]

In various parts of India socio cultural practices are responsible for the use of unhygienic products to manage periods instead of much safer sanitary pads.[3] Women are forbidden to bath or cleanse themselves properly during these days, which increase the threat posed to their health . There are varied practices regarding proper disposal of material used and social taboos imposed during this period.

In some settings menstruating women are viewed as impure, so they are separated from men and banned from using the same water sources in order not to contaminate them [4,5]. These taboos and social beliefs have led some women to internalize this stigma, reporting that they feel dirty when menstruating and are ashamed of it.[5]

Habits like changing sanitary napkins every four hours and washing hands every time sanitary napkin is changed are small but significant steps towards ensuring good hygiene during periods.[3-5] Infections due to lack of menstrual hygiene and the lack of awareness among women regarding cleanliness of genital areas and access to safe menstrual hygiene products contribute to 97% of the problem.[5]

According to the National Family Health Survey (NFHS-V), in India, 55% of women in the age group 15-24 years use sanitary napkins, 62 % use cloth, and 16 % use locally prepared napkins.[6] Under the National Health Mission (NHM) the government has started the distribution of sanitary napkins at nominal rate and frontline workers like ASHAs, AWWs and ANMs. The Department of Health and Family Welfare, Rajasthan has been distributing beltless sanitary napkins in a pink plastic packing named “Freedom” to girls in the age group 10-19 years through the health department since 2018.[7] Today girls in the age group 10-19 years who are enrolled in government schools get 12 pads per month from the school and those who are out of schools get the same from the anganwadi centres. However government made sanitary pads available from Accredited Social Health Activist(ASHAs) and Anganwadi worker (AWW) at a subsidized rate ,Rs 2/- per pad as a form of social marketing.[7]

The women from tribal and scheduled caste community in rural part of Rajasthan suffer from extreme lack of access to information about safer ways of managing periods as reported by many social activists proactively working for raising awareness regarding menstrual hygiene among them.[8,9]

It is important to study the utilization and acceptance of the sanitary pads distributed frees of cost among adolescents and at a nominal rate to women and identify the gaps in practices recommended for menstrual hygiene in semi arid areas.

Objectives:

1. To study the current menstrual hygiene practices and identify gaps in menstrual hygiene practices among women aged 15-45 years in semi arid urban and rural areas of Pali district
2. To study the acceptance and utilization of government distributed sanitary napkins in urban and rural areas of the district

Method:

This cross sectional study was conducted among women aged 15-45 years in six urban wards in the catchment area of District hospital and six sub-centre villages under the Rural Health and Training Centre(RHTC) at PHC Gundoj.

A pre tested semi structured questionnaire (modified and adapted to Indian context) was used by trained volunteers to collect data regarding knowledge, attitudes and practices of menstrual hygiene by interview of participants over a period of 6 months.[10,11] The questionnaire was translated to vernacular language and back translated to English by two independent researchers.

An average score on seven knowledge points was taken and Good knowledge of menstruation and menstrual hygiene was given to those respondents who scored 5–7 points and Poor Knowledge was given to those who scored 0–4 points . The practice of menstrual hygiene score was calculated out of ten practice specific questions. Each correct response on recommended practices of menstrual hygiene earned one point and Good practice of menstrual hygiene was given to those respondents who scored more than or equal to 6 points .

Areas of survey in urban and rural areas were selected purposively but participants within the area were selected using simple random sampling until sample size was achieved. Studies have shown a variation of 25-70% [4,12,13] in prevalence of hygienic menstrual practices. Keeping power of study at 80% adding the 10% non-response and average 50% prevalence for hygienic menstrual practices, a sample size of 384 participants was taken,192 each from rural and urban areas with 50% of the participants being school going girls.

Inclusion criteria:

Women (15-45 years) who had attained menarche at the beginning of the study had been assessed for practice regarding menstrual hygiene.

Exclusion criteria:

Women not willing to take part in the study were excluded from the study. Women who were seriously ill were excluded from the study.

Data was analysed using Epi info software version 7.2 for proportions using appropriate statistical test of significance.

Ethical considerations: Institutional Ethical clearance was obtained and informed written consent was taken from all participants.

Results:

In this study, 192 participants were from urban area and 192 were from rural area of the district. Among the 384 participants, only 130(34%) were aware about the social marketing of sanitary napkins by the government. Around 223(58%) correctly described the reason for menstruation (bleeding from the uterus) and 173(46%) knew about the harmful effects of unhygienic absorbent material. Around 82(43%) participants in urban and 9(4%) in rural were buying commercially available napkins. Knowledge about proper disposal of napkins was found to be among 78.6% and 34% buried used cloth napkins in a pit in the house /fields in rural areas. Good knowledge of all points of healthy menstrual practices were among 23% in rural areas and 66% in urban areas (Table 1 reflects average of seven knowledge points). Among school going participants 184 (95.8%) in urban areas and 169 (88%) were utilizing the sanitary pads distributed free of cost in schools, rest used locally purchased "red cloth". Among non school going participants 14% were utilizing the government distributed napkins available at a nominal cost at Anganwadi /health centres.

Average level of hygiene practices was comparatively more among urban participants 173(90%) than rural women 77(40.1%) (p value<0.05). (Table 2) Most participants (90%) of both urban and rural respondents wanted more knowledge regarding the subject from health workers.

During menstruation restrictions on performing religious activities, doing idol worship, using the kitchen, eating and drinking water with family, jumping and running and consequent absenteeism were reported by respondents.

Discussion:

Since February 2018, the Rajasthan government has been distributing sanitary napkins free of cost to rural adolescent girls and at a nominal charge to women. Further with a goal to encourage women in rural areas to adopt menstrual hygiene practices and handle their periods with dignity and safety, the government launched a menstrual hygiene management campaign on July 31, 2018. The

Table 1: Key parameters of menstrual hygiene knowledge among urban and rural participants

Variables	Area		χ^2 Value	p-value
	Urban (n1=192)	Rural (n2=192)		
Why menstruation happens	169(88.0%)	123(64.1%)	30.247	0.000
It is blood from uterus	154(80.2%)	69(35.9%)	77.275	0.000
It is normal physiological process	180(93.8%)	172(89.6%)	2.182	0.140
Pain during periods is normal	138(71.9%)	134(69.8%)	0.202	0.653
One should dry the cloth in sunlight before reuse	168(87.5%)	108(56.3%)	46.377	0.000
One should not reuse cloth till it tears /beyond 6 months	157(81.8%)	90(46.9%)	50.941	0.000
One should dispose in plastic/paper cover	173(90.1%)	129(67.2%)	30.020	0.000
Total Score (one point for each of the seven knowledge points)				
Good knowledge(5-7 points)	127(66.1%)	44(22.9%)	72.629	0.000
Poor Knowledge(0-4 points)	65(33.9%)	148(77.1%)	72.629	0.000

Table 2: Key parameters of menstrual hygiene practices among urban and rural participants

Variables	Area		χ^2 Value	p-value
	Urban (n1=192)	Rural (n2=192)		
Use government distributed sanitary pa (free of cost) materials during menstruation	184(95.8%)	169(88.0%)	7.895	0.005
Uses commercially available brands	82(43.0%)	8(4.2%)	0.844	0.358
Buy red cloth from ladies stores and use	2(1.0%)	23(12.0%)	18.868	0.000
Clean red cloth with soap and water	5(2.6%)	2(1.0%)	1.310	0.252
Dry used cloth in sunlight	2(1.0%)	2(1.0%)	0.000	1.000
Change pads or cloth more than once /day and above during menstruation	90(46.9%)	67(34.8%)	5.700	0.017
Disposes used sanitary pads in dustbin in plastic bag	65(33.9%)	125(65.1%)	37.504	0.000
Uses paper to dispose the pads by wrapping in paper	146(76.0%)	19(9.9%)	171.400	0.000
Bury the pad/cloth used in pit/soil	2(1.0%)	48(25.0%)	48.655	0.000
Takes bath daily with soap during menstruation	184(95.8%)	173(90.1%)	4.820	0.028
Clean external genitalia during menstruation	165(85.9%)	134(69.8%)	14.520	0.000
Practice (summary index)				
Good practices (follow≥6 recommended practices)	173(90.1%)	77(40.1%)	105.640	0.000

campaign, which was a joint effort between the departments of Women and Child Development, Panchayati Raj and Rural Development, and Health and Family Welfare, addresses the issue of taboos related to menstruation and encourage women in rural areas to speak more freely on "chuppitododiwas" every three months about menstrual hygiene issues.[8,9] Our study showed good acceptance 96% and 88% respectively in urban and rural areas of the sanitary pads distributed among adolescent girls in schools and Anganwadis. However in rural areas 14% of women continued to use the red cloth or "kapda" which was not properly sundried after use. It was dried inside homes in unhygienic corners inside or outside where it could not be seen. This is similar to the study by Choudhary N et al (2019) in rural areas of adjacent Jodhpur district.[4] Knowledge levels about healthy menstrual practices were higher in urban areas (66%) as compared to rural areas (23%).This is similar to the finding from other studies done in Rajasthan in Jodhpur and Udaipur.[4,12]

However cultural taboos existed in both rural and urban areas in Pali wherein menstruating girls do not visit religious places , do not water the holy basil (tulsi) and do not even enter the kitchen. This is similar to the findings in other studies by DeoDS et al(2005) , Grace G et al(2019 in Kancheepuram) and Shaili V (2021).[14-16]

Women of rural area were less aware about bleeding from the uterus in comparison to urban (14% versus 73%) in this study, which is also evident from a study done by Kalpana Katiyar et al 2013 in Meerut.[17] The possible reason for lower awareness among rural girls is lack of literacy of their mother, sisters, friends or elderly female relatives who are usually the greatest source of information.

Bathing and keeping external genitalia clean were practiced equally in both urban and rural areas especially in households with access to closed toilets. The safe disposal of napkins in an environment-friendly manner is a real challenge in semi-arid areas. Regarding disposal practices, in rural areas sanitary pads were mostly thrown in dustbins or buried in the ground /fields. In urban areas pads were wrapped in plastic or newspaper and disposed in dustbins. In a study by Kothari B (2010 Jaipur) similar practice of disposal was seen.[18] Lack of toilet facilities at school with no dustbins, lockable toilet doors and lack of water led to discomfort in changing pads and hence absenteeism among rural and urban adolescents. Vashisht R et al. (2018) and Jothy K et al (2012) also reported similar findings.[19,20]

Conclusions:

Distribution of Sanitary pads in schools is a successful intervention of NHM in Pali District. However knowledge of healthy menstrual hygiene practices was low among rural women. Soft and absorbent pads supplied in schools were used by 93% of respondents; rest used locally purchased red cloth. Among the respondents 90% wanted more knowledge from health workers regarding the subject.

Recommendations:

Disposal of used pads and attitude towards social taboos need to be addressed in the rural areas of the district. Better convergence between Education, ICDS and Health department for advocacy of healthy menstrual hygiene practices is required. Self help groups and NGOs can further advocate use and proper disposal of free sanitary napkins. Menstrual hygiene day on May 28 should be commemorated more openly to spread awareness on the issue.

Declaration:

Funding: Nil

Conflict of Interest: Nil

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A Study on Knowledge Related to Oral Cancer and Attitude towards Screening among Patients Attending a Rural Hospital in West Bengal

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Abstract:

Introduction: Oral cancer is a major public health problem in India. Screening of the disease has an important role in early detection resulting in improved patient outcomes with reduced mortality and morbidity. The present study was undertaken to assess the awareness about oral cancer and attitude towards screening among patients attending a rural hospital in West Bengal and elicit its associated factors if any. **Method:** This cross-sectional study was conducted from September to December 2020 among 244 adults attending the Dental OPD of Amtala Rural Hospital, South 24 Parganas, West Bengal. Data collection was done via face-to-face interview using a pre-tested structured questionnaire. Knowledge regarding oral cancer and attitude towards screening was assessed using an 18-item and 8-item questionnaire respectively. Logistic regression analysis was done to find out the factors associated with satisfactory knowledge and favourable attitude. **Results:** Satisfactory knowledge of oral cancer was observed among 26.6%, while favourable attitude towards screening among 29.9% of the participants. Younger age, educational level above secondary and non-usage of smokeless tobacco were significantly associated with satisfactory knowledge of the disease. Educational level above secondary, nuclear family members and smokers hada significant association with favourable attitude towards screening. **Conclusion:** There was a lack of awareness about oral cancer and an unfavourable attitude towards screening among a significant proportion of the participants. Intensive health education for increasing community-level awareness about the disease and benefits of routine screening would help in the reduction of the burden of oral cancer in the future.

Keywords: Attitude; Knowledge; Oral cancer; Screening

Introduction:

Oral cancer has emerged as a leading public health problem in India. Globally, the incidence of oral cancer has been estimated to be about 4 cases per 1 lakh population while in some Asia-Pacific countries, it ranks among the top three cancers.[1] However, the situationin India is rather worrisome as oral cancer ranks number one in terms of incidence among men and third among women and is responsible for approximately 52000 deaths per year.[2,3] However, the disease prognosis mainly dependsupon the stage of the tumour at the time of

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Ghorui AK, Paul B, Bandopadhyay L, Bhattacharyya M, Banerjee A, Pal NS. A Study on Knowledge Related to Oral Cancer and Attitude towards Screening among Patients Attending a Rural Hospital in West Bengal. Healthline. 2021; 12(4): 84-93.
	DOI : 10.51957/Healthline_271_2021	

diagnosis. The five-year survival rate of stage I cancer, irrespective of its sub-sitesis approximately 80%, while the same with advanced disease (stages III/IV) is approximately only 20%.[4] In addition to the mortality, oral cancer is significantly associated with significant morbidity not only due to the disease process itself but also due to the treatment procedures rendered to combat it which can lead to increased out of pocket expenditure due to frequent hospitalizations.

Numerous etiological factors are associated with the development of oral cancer among which the major modifiable risk factors are tobacco and alcohol consumption (often having a synergistic effect among themselves).[5] However, the major silver lining is that oral cancer is largely preventable which can be achieved by eliminating the major risk factors (primordial prevention) while early diagnosis of the disease by screening (primary prevention) can halt its progression to late stages, thereby increasing the chances of survival among patients.

Government of India launched the National Programme for Prevention and Control of Cancer, Diabetes, Cardio Vascular Diseases and Stroke (NPCDCS) in October 2010.[6] Under this program, opportunistic population-based screening of individuals at risk of selected non-communicable diseases (including oral cancer) is being conducted at the primary healthcare level to facilitate early diagnosis and management of the disease. However, these services have been found to be largely unutilized which is evident as per NFHS-5 data in rural West Bengal.[7]

Studies across the globe and in India have demonstrated a varying proportion of participants having poor knowledge related to oral cancer and unfavorable attitude towards screening.[8-11] Lack of awareness related to risk factors, signs, and symptoms of oral cancer as well as negative attitude towards screening for the disease may pose a great challenge for the clinicians as well as policymakers to control the growing burden of oral cancer in the Indian society. Thus, the present study was undertaken to find out the level of awareness about oral cancer and assess the attitude towards availing screening facilities for the disease among patients attending adental out-patient department (OPD) at Amtala Rural Hospital in South 24 Parganas district, West Bengal.

Method:

This cross-sectional study was conducted from September to December 2020 among adult patients attending a dental OPD of Amtala Rural Hospital situated in South 24 Parganas district, West Bengal. Participants who did not give written informed consent, or had severe speechand hearing impairment were excluded from the study.

Sampling

A study was done in a rural area of Karnataka (India) by Vishma BK et alwhich demonstrated 39.5% of their participants hadno knowledge regarding symptoms oforal cancer.[12] Considering P=0.395, Z1-α=1.96; relative error (L) = 20% in the formula $(Z_{1-\alpha})2\times(P\times Q/L^2)$, the calculated sample size arrived at 147. As simple random sampling was not done, after adding a 1.5 design effect and a 10% non-response rate, the final sample size came to be 244.

We viewed the patient register for the past 3 months and noted the information regarding the average footfall of patients daily in the dental OPD. It was observed that on average, 50 patients attended the dental OPD daily for getting treatment. Since we visted the health facility twice per week for data collection for a period of 4 months and interview of the participants took approximately 20 mins, we decided that we will interview 5 patients per day. Since on an average, 50 patients visited the health facility and 5 participants were needed to be interviewed per day, participants were selected by systematic random sampling wherein every 10^{th} patient was chosen from those who attended the dental OPD on the days of data collection (sampling interval=50/5=10).

Data Collection

The study was conducted via face-to-face interview using a pre-designed pre-tested structured questionnaire translated into the local language (Bengali). It encompassed the following domains:

(a) Socio-demographic characteristics and substance use pattern of the study participants

(b) Knowledge related to oral cancer was assessed by an 18-item questionnaire prepared after an extensive literature review.[13] It comprised of three domains: general awareness regarding oral cancer (5 items), signs and symptoms of oral cancer (8 items) and risk factors of oral cancer (5 items). Pretesting was done among 40 patients in a different setting who were not included in the study. [Cronbach's alpha=0.72] Response categories for each of the questions were 'yes', 'no', and 'don't know'. Each question answered correctly received a score of 1 and each answer marked incorrectly or as 'Don't know' received a score of 0. The maximum attainable score was 18 and the minimum attainable score was 0. The cut-off for satisfactory knowledge was taken to 9 or more (50% of the attainable total scores).

(c) Attitude towards oral cancer screening was assessed by an eight-item questionnaire (Cronbach's alpha= 0.67). Response categories for each of the questions were 'Disagree', 'Neither agree nor disagree', and 'Agree' which were given a score of 0, 1, 2 respectively. The maximum attainable score came to 16 and the minimum attainable score was 0. An attitude score ≥ 12 (75% of themaximum attainable scores) was considered as having favorable attitude towards screening for oral cancer among the study participants.

Statistical Analysis

Data were analyzed using Microsoft Excel 2016 and Statistical Package for Social Sciences (SPSS version 16.0, SPSS Inc., Chicago, USA) software. Appropriate descriptive statistics were used to denote the outcome variables and the predictor variables. Variance Inflation Factor (VIF>5) was calculated to exclude multicollinearity among the variables. Factors associated with knowledge regarding oral cancer and attitude towards its screening were analyzed using a test of significance (p-value<0.05) at a 95% confidence interval via univariate binary logistic regression analysis. All the biologically variables having significant p-value (<0.05) were included in the final multivariable model.

Ethical issues

After getting institutional ethical clearance, participants were requested to provide written informed consent before participating in the survey.

Results:

Socio-demographic characteristics of the study participants

The median age of the study participants was 42 years (Inter Quartile Range (IQR) = 29-55 years). Around 54.1% of the participants were males while 61.9% were Hindu by religion. Almost 53% of the participants had secondary level of education or above. According to B.G. Prasad's socio-economic scale 2020, 52.9% of them belonged to the Class IV or below socio-economic status.[14] Most of the study participants had joint family status (75.4%).

Substance use pattern of the study participants

Usage of tobacco for smoking purposes was found among 78 (32%) study participants. Among them, 15.6% used to smoke daily. Almost (75.1%) smokers started smoking when they were ≤30 years of age and 35.7% started smoking when they were ≤10 years of age. 34.2% of the participants wanted to quit smoking. Usage of smokeless tobacco was present among 110 study participants (45.1%) among which 38.1% useds mokeless tobacco daily. Almost (76.4%)of smokeless tobacco users had their initiation at age ≤30 years whereas 56.8% of them started using it at ≤10 years of age. Participants who

wanted to quit using smokeless tobacco comprised 62.8% of the participants. Participants using betel quid were found to be 167 (68.4%) and among them, 56.9% used it occasionally. The majority of users (95.5%) started to use it when they were ≤30 years of age and 42.8% used it when they were ≤ 10 years of age. Participants who wanted to quit using betel quid were found to be 61%. Around 58 (23.8%) participants were found to be alcoholic among which 44.5% used it occasionally. Most alcoholics (88.4%) wanted to quit drinking.

Knowledge related to Oral cancer

Overall satisfactory knowledge of oral cancer was observed among 65 (26.6%) study subjects. All the study participants (n=244) had heard about oral cancer. A total of 88 (36.1%) participants believed that the prevention of oral cancer was not possible. Most of the participants(76.2%)knew that oral cancer is a life-threatening condition. Only 87(35.7%) of the study participants knew that oral cancer is treatable. Most of the subjects 197 (72.9%) did not know that oral cancer is non-contagious while 42.2% believed that the risk of oral cancer increases with age. Among the 244 study subjects, 42.5% did not know any of the signs and symptoms of oral cancer. 139 study participants (57%) knew that a non-healing wound in the mouth is a probable sign of oral cancer. About half (49.6%) knew that the growth of abnormal tissue in the mouth is a sign of oral cancer. Certain signs/symptoms of oral cancer were found to be not known by the majority of the study participants such as white or red spots in the mouth (82.3%), reduction in mouth opening (86.1%), undue falling of teeth (82.4%), difficulty in swallowing (84.4%), burning sensation during eating (68.4%) and continuous pain in mouth (55.9%).Majority of the study participants(70.1%) knew that smokeless tobacco is a risk factor for oral cancer. Only 32.8% and 12.3% of the participants considered smoking and alcohol as risk factors of oral cancer respectively. About one-fourth of study subjects knew that betel quid is a risk factor for oral cancer. [Table1]

Attitude towards oral cancer screening

Overall favorable attitude towards getting screened for oral cancer was observed among 29.9% of study participants. The majority of the study participants (93.4%) have not undergone screening for oral cancer in their lifetime However, most of the study participants(70.9%) agreed that doctors can diagnose oral cancer early. While 72% of study participants agreed that a doctor can help them in reducing the risk of getting oral cancer. Only 36.9% of the study participants agreed with the statement that a doctor examining his/heroral cavity for signs of cancer will not be a waste of time. Only 26.2% of study subjects agreed that a doctor examining their oral cavity for any signs of cancer will not give them discomfort. [Table 2]

Factors associated with satisfactory knowledge related to oral cancer

Univariate binary logistic regression analysis showed that satisfactory oral cancer knowledge was significantly associated with age, education, socio-economic status, usage of smokeless tobacco and betel nut. All these variables were included in the final multivariable model. In the final model factors significantly associated with satisfactory knowledge were decreasing age [AOR=1.08, 95% CI=1.04-1.11], educationalstatus as Secondary and above [AOR=11.51, 95% CI=4.12-18.31], nonuser of smokeless tobacco [AOR=2.32, 95%CI=1.18-7.62]. The non-significant Hosmer-Lemeshow test of significance (p-value> 0.05) indicated the goodness of fit of the model while 29-42% of the variance of the dependent variable could be explained by this multivariable model. [Cox and Snell's R2=0.29 and Nagelkerke's R2= 0.423]. [Table 3]

Factors associated with favorable attitude towards screening for oral cancer

Univariate logistic regression showed that a favorable attitude towards oral cancer screening was significantly associated with religion, educational status, socio-economic status, type of family and usage of tobacco for smoking purposes. Multi variable logistic regression analysis showed that

Table 1: Responses of the study participants on the 18-item questionnaire for assessing knowledge related to oral cancer [N=244]

Questions	Yes n (%)	No n (%)	Don't know n (%)
General awareness oral cancer			
Is prevention of Oral cancer [OC] possible	88(36.1)	64(26.2)	92(37.7)
Is the treatment of OC possible	87(35.7)	87(35.6)	70(28.7)
Is OC contagious	47(19.3)	66(27.1)	131(53.6)
Does the risk of OC increase with age	103(42.2)	47(19.3)	94(38.5)
Is OC life-threatening	186(76.2)	23(9.5)	35(14.3)
Knowledge of signs/Symptoms of Oral Cancer			
Growth of abnormal tissue	121(49.6)	43(17.6)	80(32.8)
Non-healing wound	139(57)	38(15.5)	67(27.5)
White or red spot	48(19.7)	58(23.7)	138(56.6)
Reduced mouth opening	34(13.9)	90(36.9)	120(49.2)
Undue falling of teeth	43(17.6)	95(38.9)	106(43.5)
Continuous pain in the mouth	110(45.1)	62(25.4)	72(29.5)
Difficulty in swallowing	38(15.6)	138(56.5)	68(27.9)
Burning sensation during eating	77(31.6)	70(28.6)	97(39.8)
Knowledge regarding risk factors of oral cancer			
Smoking	80(32.8)	96(39.3)	68(27.9)
Smokeless tobacco	171(70.1)	11(4.5)	62(25.4)
Alcohol	30(12.3)	140(57.4)	74(30.3)
Betel quid	52(23)	38(15.6)	158(61.4)
Family history of oral cancer	61(25)	71(31.6)	106(43.4)

*OC= Oral Cancer

educational status of secondary level and above [AOR=2.01, 95%CI=1.32-5.58] nuclear family [AOR=2.26, 95%CI=1.15-4.41] and usage of tobacco for smoking [AOR=6.98, 95%CI=2.44-14.14] to be significantly associated with favorable attitude towards screening. The final multivariable model had good fitness (Hosmer-Lemeshow test of significance=0.363) while 34-49% of the variance of the favorable attitude could be explained by the model [Cox & Snell R^2=0.34 & Nagelkerke R^2= 0.49]. [Table 4]

Discussion:

The proportion of participants having overall satisfactory knowledge concerning oral cancer was observed to be 26.6% in the current study while 73.4% of the participants had poor knowledge. This finding was quite similar to a study conducted by Awojobi O et al in London who found that 77% of their participants had very little knowledge related to oral cancer.[10] A study was conducted in Mandya, Karnataka in 2015 by Vishma BK et al which showed that 39.5% of their participants did not know the

Table 2: Responses of the study participants on the 8-item questionnaire for assessing attitude towards screening for oral cancer [N=244]

Questions	Agree n (%)	Disagree n (%)	Neither agree nor disagree n (%)
It is easy to visit a doctor for screening of oral cancer	85(34.8)	71(29.1)	88(36.1)
It is easy to allow a doctor for examining my oral cavity for signs of cancer	173(70.9)	9(3.6)	62(25.5)
A doctor can help me to reduce the risk of oral cancer	174(71.3)	18(7.4)	52(21.3)
Examination of my oral cavity by a doctor will not be a waste of time	90(36.9)	96(39.3)	58(23.8)
Examination of my oral cavity will lead to early diagnosis of any cancer signs	124(50.8)	45(18.5)	75(30.7)
Examination of the oral cavity will not give me discomfort	64(26.2)	92(37.7)	88(36.1)
Regular examination of the oral cavity should be done five-yearly.	21(8.6)	121(49.6)	102(41.8)
Regular examination of the oral cavity reassures me that everything is alright	126(51.6)	46(18.8)	72(29.6)

signs and symptoms of oral cancer, while 36.7% believed that oral cancer is preventable.[12] Our study also found quite a similar finding as 42.5% of the study participants did not know any of the signs and symptoms of oral cancer while 36.1% believed that oral cancer is preventable.

Awareness regarding curability and treatment of oral cancer was present among 35.7% of the participants which was found quite similar to the study conducted by Ravoori S et al in Guntur city of Hyderabad, India.[15] Regarding signs and symptoms, approximately half of the participants were aware that growth of abnormal tissue was a common symptom of oral cancer while 57% of them knew the dangers of having a non-healing wound. This finding was similar to the study conducted by Konduru et al in Tamil Nadu (India).[16] With regards to quitting substance use, nearly 33% wanted to quit smoking while 63% wanted to quit using smokeless tobacco in the current study. This was found to be slightly in contrast to data as per Global Adult Tobacco Survey 2 (2016-2017) were 55.4% of smokers and 49.6% of smokeless tobacco users wanted to quit substance use.[17]

Younger age was found to be significantly associated with satisfactory knowledge related to Oral Cancer which was found similar to a study done by Agarwal M. et.al.[13] Higher education level was significantly associated with satisfactory knowledge among the participants. Participants with education above secondary level showed higher chances of having satisfactory knowledge compared to those who had secondary education or below. This finding was similar to the study conducted by Ravoori S. et al where the level of knowledge regarding oral cancer increased with an increase in the educational level.[15]

With regards to attitude for screening for oral cancer, approximately 30% of the participants had a favourable attitude. The majority have not undergone oral cavity examination for screening purposes which was found similar to a study conducted by Vishma BK et al.[12] Participants with educational status above secondary level showed higher chances of having a favourable attitude

Table 3: Factors associated with satisfactory knowledge related to oral cancer among the study participants : Logistic Regression Analysis [N=244]

Variables	Total N (%)	Satisfactory knowledge n (%)	Unadjusted OR (95% CI)+	Adjusted OR (95% CI)+
Decreasing Age (in years) **			**1.11(1.08-1.15)***	**1.08(1.04-1.11)***
Gender				
Male	132(54.1)	39(29.5)	1.39(0.88-2.53)	
Female	112(45.9)	26(23.2)	1(Reference)	
Religion				
Hindu	151(61.9)	48(24.6)	2.08(0.82-4.12)	
Muslim	93(38.1)	17(17.6)	1(Reference)	
Educational status				
Secondary and above	130(53.3)	59(45.4)	**14.96(5.86-22.98)**	**11.51(4.12-18.31)***
Below secondary	114(46.7)	6(5.3)	1(Reference)	1(Reference)
Type of family				
Nuclear	60(24.6)	23(38.3)	2.10(0.72-3.15)	
Joint	184(75.4)	42(22.8)	1(Reference)	
Socio-economic status				
Class IV or below	129(52.9)	22(17.1)	1(Reference)	1(Reference)
Above Class IV	115(47.1)	43(37.4)	**2.90(1.81-6.82)***	1.9(0.8-4.7)
Smoking status				
Smoker	78(32)	18(23.1)	1(Reference)	
Non-smoker	166(68)	47(28.3)	1.32(0.71-2.54)	
Drinking status				
Alcoholic	58(23.8)	18(31)	1.33(0.56-2.38)	
Non-alcoholic	186(76.2)	47(25.3)	1(Reference)	
Usage of Smokeless tobacco				
User	110(45.1)	16(14.5)	1(Reference)	1(Reference)
Nonuser	134(54.9)	39(36.6)	**2.41(1.61-7.88)***	**2.32(1.18-7.62)***
Usage of Betel quid				
User	167(68.4)	34(20.4)	1(Reference)	
Nonuser	77(31.6)	31(40.3)	**2.63(1.61-5.84)***	1.1(0.41-2.83)

*significant p value (<0.05), **continuous variables # only variables which have come significant in the univariate analysis have been included in the final multivariable model. +OR= Odds ratio, CI= Confidence interval Hosmer-Lemeshow's test of statistical significance=0.787, Cox & Snell R^2=0.290 & Nagelkerke R^2= 0.423

Table 4: Factors associated with favourable attitude towards screening for oral cancer among the study participants: Logistic Regression Analysis [N=244]

Variables	Total N (%)	Favorable attitude n(%)	Unadjusted OR (95% CI)+	Adjusted OR (95% CI)+
Decreasing Age (in years) **			0.98(0.97-1.01)	
Gender				
Male	132(54.1)	42(31.8)	1.22(0.72-2.18)	
Female	112(45.9)	31(27.7)	1(Reference)	
Religion				
Hindu	151(61.9)	54(35.8)	**2.23(1.22-3.91)***	1.91(0.97-3.72)
Muslim	93(38.1)	19(20.4)	1(Reference)	1(Reference)
Educational status				
Secondary and above	130(53.3)	54(41.5)	**2.17(1.91-6.53)**	**2.01(1.32-5.58)***
Below secondary	114(46.7)	19(16.7)	1(Reference)	1(Reference)
Type of family				
Nuclear	60(24.6)	28(46.7)	**2.70(1.51-4.92)***	**2.26(1.15-4.41)***
Joint	184(75.4)	45(24.5)	1(Reference)	1(Reference)
Socio-economic status				
Class IV or below	129(52.9)	30(23.3)	1(Reference)	1(Reference)
Above Class IV	115(47.1)	43(37.4)	**1.97 (1.12-3.45)***	1.32 (0.61-2.82)
Smoking status				
Smoker	78(32)	47(60.2)	**8.16(3.66-26.28)***	**6.98(2.44-14.14)***
Non-smoker	166(68)	26(15.6)	1(Reference)	1 (Reference)
Drinking status				
Alcoholic	58(23.8)	17(29.3)	1(Reference)	
Non-alcoholic	186(76.2)	56(30.1)	1.04(0.51-1.98)	
Usage of Smokeless tobacco				
User	110(45.1)	31(28.2)	1(Reference)	
Nonuser	134(54.9)	42(31.3)	1.2 (0.75-2.18)	
Betel quid				
User	167(68.4)	48(28.7)	1(Reference)	
Nonuser	77(31.6)	25(32.5)	1.2(0.72-2.17)	

*significant p value (<0.05), **continuous variables # only variables which have come significant in the univariate analysis have been included in the final multivariable model.+OR= Odds ratio, CI= Confidence interval Hosmer-Lemeshow's test of statistical significance=0.363, Cox & Snell R^2=0.34 & Nagelkerke R^2= 0.49

towards oral cancer screening than the rest and this relationship was found to be statistically significant. Smokers showed significantly higher odds towards favourable attitude compared to non-smokers This finding was similar to a study done by Awojobi O. et. al. where an increased level of education was found to be associated with a positive attitude. Their study also demonstrated smokers and alcoholics having a more favorable attitude for getting screened for oral cancer.[10]

Limitations of the study:

Since this study was conducted as a cross-sectional interview, hence the causal association between knowledge of oral cancer and attitude towards screening with the independent variables could not be determined.

Conclusion:

The findings of the present study showed that there was a lack of awareness about oral cancer and an unfavorable attitude towards its screening among a significant proportion of the participants. Intensive awareness campaignsat the community level for increasing population-level awareness about oral cancer and its related risk factors as well as motivation and counselling for availing the screening services should be undertaken asa part of the national programme dedicated for non-communicable diseases (NPCDCS). This in turn will help in early detection and treatment of the disease thereby reducing the morbidity and mortality burden in the long run. Moreover, de-addictionprogrammesat the community level should also be undertaken as a sizable proportion of thestudy participantsin the current study was detected who wanted to quit substance use.

Acknowledgement: We would like to thanks all the study participants who took time from their busy schedules to participate in the study.

Declaration:

Funding:Nil

Conflict of interest: Nil

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Hesitation, Delays and Barriers towards COVID-19 Vaccination among Educated Class in Northern India

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Abstract:

Introduction: Vaccine hesitancy has emerged as one of the leading global health threats as identified by WHO, that may be detrimental to efforts to control the pandemic. Frequent interruptions in the vaccine supply clubbed with hesitancy can result in lower immunization coverage than expected. Assessing factors influencing the behavioural decision to accept, delay or reject is imperative in scaling-up the vaccine uptake. **Objectives:** To estimate the delay and its determinants towards COVID-19 vaccination among educated class in Northern India. **Method:** An online cross-sectional, observational study was conducted among teachers and their family members, close relatives and friends across India among 362 adults aged 18 years or more using structured questionnaire incorporated into kobo toolbox wherein information pertaining to vaccination hesitancy among study subjects was sought. **Results:** The present study revealed 43% of participants were totally unvaccinated. Most common barriers towards delayed or non-vaccination included apprehension about the side effects, doubts regarding vaccine effectiveness. **Conclusion:** Risk communication and vaccine advocacy should be tailor-made in a manner to dispel all doubts and concerns of the general public and counter the misinformation, which will help in addressing this huge vaccination gap.

Keywords: Barriers, COVID-19, Delay, Vaccine hesitancy

Introduction:

Immunization has proved to be the most cost-effective preventive interventions amongst all the methods of fighting the pandemic. Many countries have successfully developed vaccination programs against COVID-19; as of 14th May 2021, there were 180 vaccines in pre-clinical development and 100 vaccines in clinical development.[1] But vaccine development alone can't help battle the pandemic. Vaccine acceptance among the general public and healthcare workers appears to have a decisive role in the successful control of the pandemic.[2] As defined by World Health Organization (WHO) Strategic Advisory Group of Experts on Immunization (2015), "Vaccine hesitancy" refers to delay in acceptance or refusal of vaccination despite availability of

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Laskar AR, Behera S, Poddar AS, Rasania SK, Saha SS. Hesitation, Delays and Barriers towards COVID-19 Vaccination Healthline. 2021; 12(4): 94-99.
	DOI : 10.51957/Healthline_275_2021	

vaccination services. Vaccine hesitancy is complex and context specific, varying across time, place and vaccines.[3]

India started the vaccination for COVID 19 on 16th January, 2021 among the healthcare workers (HCW), closely followed by Frontline Workers (FLW). Subsequently the vaccines were introduced in a phased manner for 60 years and above, 45 years and above and subsequently for all the adults in the age range of 18-44 years by May 2021.

Vaccine hesitancy has emerged as one of the leading global health threats as identified by WHO, that may be detrimental to efforts to control the pandemic.[4] Frequent interruptions in the vaccine supply clubbed with hesitancy can result in lower immunization coverage than expected. Assessing factors influencing the behavioural decision to accept, delay or reject is imperative in scaling-up the vaccine uptake. The rationale for conducting this study was dearth of literature on COVID-19 vaccine hesitancy acceptance in India among general public, the current study targets this population to analyse the burden of COVID-19 vaccine hesitancy among educated class of ≥18 years population and understand the reason behind their hesitancy.

Method:

An online cross-sectional, observational study was conducted among teachers and their family members, close relatives and friends across India among adults aged 18 years or more, who were willing to participate in the study during the study period. Participants who were part of any past COVID-19 vaccine trials conducted for the two vaccines (Covaxin and Covishield), and those who were not eligible for COVID-19 vaccination due to recent infection or any medical condition were excluded from the study.

Sample size

Sample size was calculated using the formula $n=Z^2*P*(1-P)/e^2$, where Z= value from standard normal distribution corresponding to desired confidence level (with z=1.96 for 95% CI), P= prevalence of the outcome variable, e= allowable absolute error. The prevalence of vaccine hesitancy was taken as 39%, which was taken from the report of fourth round of Delhi NCR Coronavirus Telephone Survey.[5] A sample size of 365 was calculated with a 5% of allowable absolute error.[5]

Data Collection tool

Data was collected using pre-tested, validated, self-administered questionnaire. A structured questionnaire incorporated into kobo toolbox wherein information pertaining to vaccination hesitancy among study subjects was sought. Socio-demographic information, vaccination category/age bracket, co-morbidity was collected. Reasons for vaccine hesitancy/delay and related concerns were ascertained.

Data Collection

Protocol and proforma was circulated in the first week of June 2021. The study participants were given a time period of 25 days to fill the forms after circulation. Convenience sampling method was used for the purpose of data collection. The online questionnaire in kobotool box was circulated among official social media platforms of groups of teachers of three selected private schools of Delhi NCR and Faridabad region and further circulated among their family members, close friends and relatives (≥18 years) residing across India. As teachers and their family members represent an educated middle-class section of the population and are expected to be less hesitant as has been reported by a study by Handebo S et al,[6] hence this group was chosen for the study.

Data analysis

Data was analysed using Statistical Package for the Social Sciences (SPSS) software version 20 (IBM Corp, Armonk, NY, USA). Descriptive data was reported as proportions and means, for categorical and continuous data, respectively. Bivariate analysis was done using chi-square statistics (Fischer exact, where applicable) for categorical outcome variables.

Ethical consideration

Strict confidentiality, privacy of data, anonymity and freedom of expression was ensured throughout the study. In built informed consent was taken, no intervention, sampling or disclosure of sensitive information was involved in this study.

Result :

Overall, 367 responses were received, out of which five responses were excluded for the purpose of data analysis, in view of incomplete information. Thus, 362 study participants were included for the purpose of analysis. More than half of the study participants (56.6%) had received at least one dose of either of the two vaccine and 43.4% were unimmunized. Most of the participants were graduates (43.6%) followed by post graduates (26.2%) and higher secondary pass (20%). Figure 1 shows state-wise distribution of study participants. Distribution of study participants among the various categories is depicted in Table 1.

Vaccine preference and uptake by the study participants

Almost 70% of the study participants preferred Covishield and 20% preferred Covaxin. However, 13 participants wanted to wait for other new upcoming vaccine and two had not decided regarding any vaccine preference. However, a delay of more than 2 months in getting the first dose vaccine was reported by majority (52.2%) of those who were vaccinated. It was noteworthy that the delayed vaccination was also reported by 18 (16.8%) HCWs and 3 (2.8%) FLWs.

Barriers towards delay or non-vaccination for COVID-19

Among the participants who were not vaccinated, most common reason was apprehension about the side effects (40.8%), followed by doubts regarding vaccine effectiveness (33.8%). More than 50% of the study participants were not sure of efficacy of the current vaccine against newer variant.

Among the participants who reported delayed vaccination, most common reason for delayed vaccination was doubts regarding vaccine effectiveness (52.3%) followed by apprehension about the side effects (48.6%). (Figure 2) Other reasons included perception regarding people getting infection even after vaccination, fear regarding getting infected while waiting for vaccination in the observation area and lack of faith in Indian vaccine. Few participants (35%) felt that the vaccines may be harmful if given during menstruation. In their opinion some of the special groups such as < 5 children and pregnant women should not be given the vaccines. Table 2 shows perception of study participants regarding vaccination among special groups. The sources that influenced the opinion of the participants were whatsapp and other social media (39%) and only 21% consulted the credible sources like online government documents available on official websites.

Discussion:

Vaccine acceptance among the educated class, may cast a powerful impact in the minds of lesser educated and marginalized sections of the general population. The current study was designed to determine the proportion of those who were unvaccinated or delayed their vaccination and explored the reasons and factors responsible for the above.

A systematic review revealed that the overall percentage of vaccine acceptance was not satisfactory; excluding few studies which reported higher acceptance (86.1% among students and 77.6% in general population).[7] As per the 4th round of Delhi NCR Coronavirus Telephone Survey (DCVTS-4) the vaccine hesitancy in Delhi NCR region was 39%, while 15% were unsure about taking the vaccine.[5] The present study revealed 43% of participants were totally unvaccinated. Vaccine hesitancy showed a declining trend among Americans over time (from 38% to 32% in in

Table 1: Association between vaccination status and sociodemographic characteristics among the study participants

Variables		Completely Unvaccinated (n=157)	Vaccinated (n = 205)	Total number of study participants (n=362)
Categories as per introduction of vaccination	Adults (18-44 years)	88 (53.0%)	78 (47.0%)	166 (45.8%)
	Adults (45-59 years)	45 (44.1%)	57 (55.9%)	102 (28.2%)
	Adults (≥60 years)	24 (38.7%)	38 (61.3%)	62 (17.1%)
	HCWs / FLWs	0	32 (100%)	32 (06.9%)
	p-value			<0.001
Gender	Female	104 (50.7%)	101 (49.3%)	205 (56.6%)
	Male	53 (33.8%)	104 (66.2%)	157 (43.4%)
	p-value			0.001
Nature of job	Employed	67 (34.9%)	125 (65.1%)	192 (53.0%)
	Unemployed#	90 (65.2%)	48 (34.8%)	138 (38.1%)
	HCWs/ FLWs	0	32 (100%)	32 (08.8%)
	p-value			<0.001

HCW: Healthcare workers; FLW: Frontline workers
#Students retired professionals, homemakers & currently unemployed.

Table 2: Perception of study participants regarding vaccination during specific conditions

Name of Special groups	No. of subjects who felt they should not be vaccinated
Pregnant women	192 (53.0%)
<5 years old children	165 (45.6%)
Breast –feeding women	102 (28.0%)
5-12 years	75 (20.7%)
Teenagers	52 (14.3%)
Immuno-compromised patients (cancer)	35 (9.6%)

2020).[8] A global study on Vaccine Acceptance revealed significantly higher vaccine acceptance among older age group, which was in concordance with the present study too.[9]

Confidence, complacency and convenience were proposed to be the determinants of vaccine hesitancy by the WHO EURO Vaccine Communications Working Group (3 Cs' model).[3] Confidence entails trust in the effectiveness and safety of vaccines, reliability and competence of the health services. In the present study majority of the unvaccinated participants expressed low confidence levels due lack of transparency and conflicting information about the effectiveness of vaccines.

Vaccination complacency coexists with low or no perceived risks of acquiring COVID-19 and is influenced by many factors such as lifestyle, responsibilities in life and absence of disease

Figure 1: Tree map showing distribution of study participants according to the state of residence

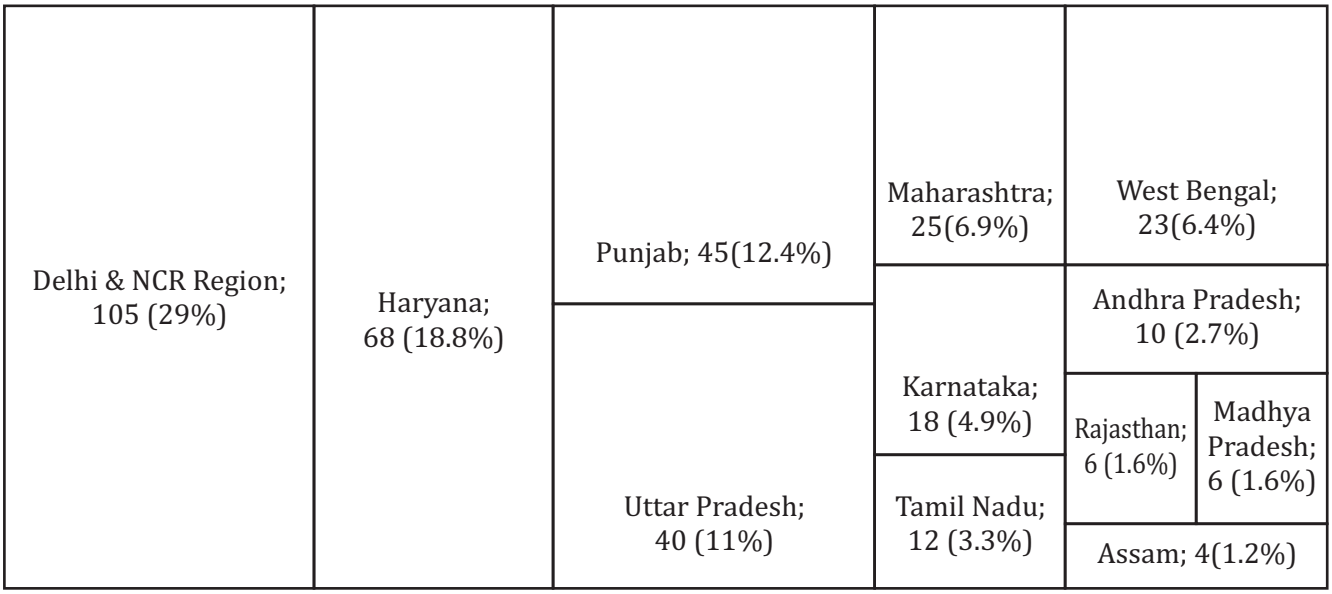
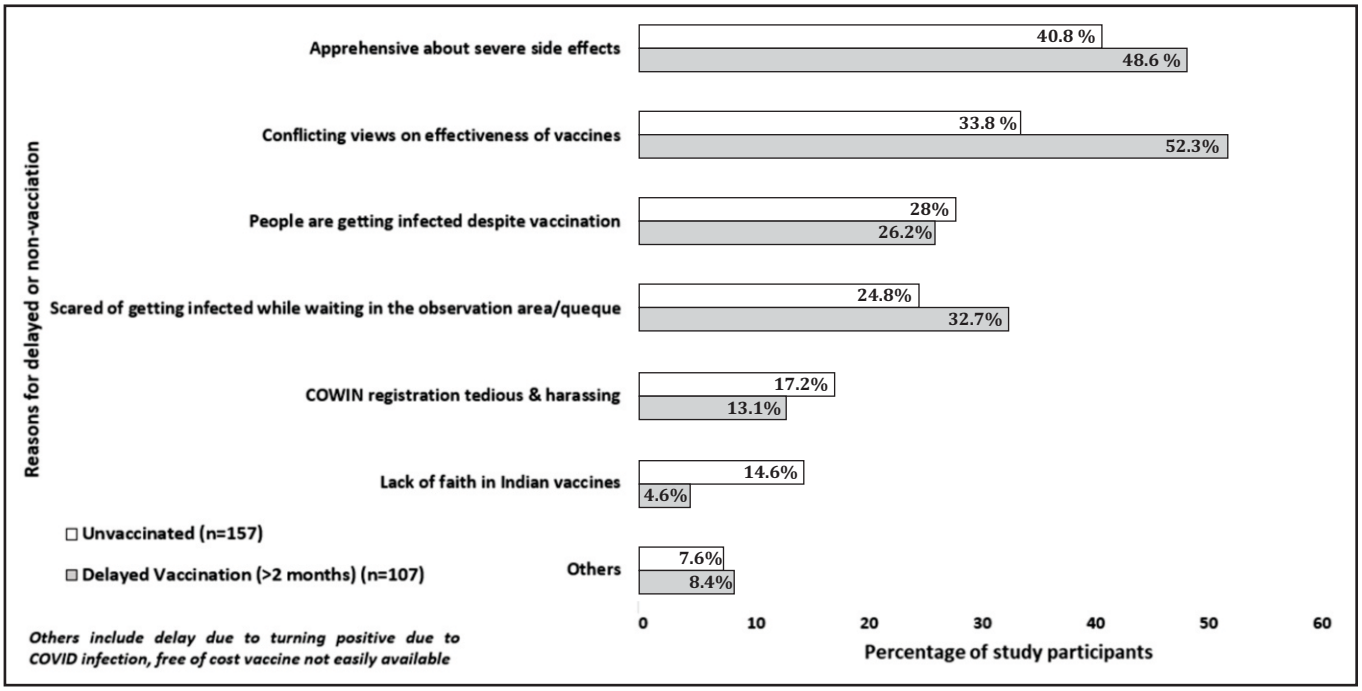


Figure 2: Reasons for delayed/ no vaccination among study participants



occurrence among family members. The present study took a note of several concerns and opinions expressed by the participants. Lower level of complacency in the current study could be attributed to info-demic, misinformation and misconceptions spread by social media channels and evolving government guidelines and advisories.[9] Some participants in the study even had misconceptions with regards to harm being caused by vaccine if taken during menstruation and the potential of the vaccine causing genetic modifications. There was a significant hesitation among the participants to vaccinate their children in a study conducted in Turkey.[10]

Another crucial factor is vaccination convenience denoted by physical availability, geographical accessibility, affordability and willingness-to-pay and other factors like registration

system. In the present study the degree of hesitancy varied across categories of vaccination depending on the ease of registration in COWIN platform. A huge chunk of 18-45 years reported harassment and delay in COWIN registration due to availability of limited slots for this age group.

One of the limitations of this study was that the pregnant and the lactating women were excluded from the study owing to which their perception and concerns could not be captured. Another major limitation is the time period of conduct of the study. There was wider availability and accessibility of free vaccine for general public subsequent to the study.

Conclusion and recommendations:

The present study observed a substantial proportion of the study participants (56.6%) had received at least one dose of either of the two vaccines. The prominent barriers noted were apprehension about side effects and doubts about vaccine effectiveness. Therefore in order to contain biological contagions of any novel pandemic, general public requires transparency in risk communication and reassurances from credible sources such as government public health bodies and make concerted efforts in curbing panic. Risk communication and vaccine advocacy should be tailor-made in a manner to dispel all doubts and concerns of the general public and counter the misinformation. Patients approaching the health care facilities for regular check-ups or routine immunization may be approached for motivational interviewing to get vaccinated against COVID-19.

Declaration:

Funding: Nil

Conflict of interest: Nil

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Drive-in Vaccination against COVID-19 in India

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Abstract:

India rolled out COVID-19 vaccination campaign in a phased manner starting from health care workers on January 2021. Now that India has opened vaccinations to all ≥18-year-olds from May 2021, government is attempting to make the vaccination campaign as quick as possible, and health authorities are experimenting with novel approach of drive-in vaccination against COVID-19in some states. This is a safe and efficient way to vaccinate a large number of people within a short period of time while maintaining social distance. This also makes it easier and more comfortable for the elderly, patients with co-morbidities or chronic diseases and differently abled individuals to receive vaccines without any difficulty that is involved in accessing the conventional vaccination sites. As the pandemic and our response to it evolve, the same models could also be employed for screening or testing of COVID-19and for dispensing of COVID-19 medications with authorized prescriptions.

Keywords: COVID-19, Covaxin, Covishield, Drive-in vaccination, Sputnik V

Introduction:

The Covid-19 vaccination camping in India was in a phased manner with initially vaccines administered only for the healthcare and frontline workers, followed by civilians aged ≥ 60 years with co-morbidities and then later, individuals ≥ 45 years without co-morbidities were also included.[1,2] Now that India has opened vaccinations to all ≥18-year-olds from 1st May 2021, government is attempting to make the vaccination campaign as quick as possible, and health authorities are experimenting with novel approach to make the vaccination even more efficient.[3]

Vaccination status of India

India rolled out COVID-19vaccination on 16th January 2021.[4] Two vaccines were granted permission by the Drug Controller General of India (DGCI), Covishield (manufactured by Serum Institute of India and Oxford University-AstraZeneca) and Covaxin (developed by Bharat Biotech).[5] In addition, Sputnik V (made by Russia - Moscow's National Research Institute of Epidemiology and Microbiology) has beenrecently approved by as a third vaccineby April 2021, with deployment set to commence in late May 2021.[6] As of now, over 18 crore people have been vaccinated with either Covishield or Covaxin, out of whom over 3.9 crore have got the second dose.[5]

India's drive-in vaccination against Covid-19

Patients are instructed to schedule an appointment, as well as register and then choose a slot, through the CoWin online portal. Mobile one-time password verification will be followed by vaccination at the drive-in vaccination sites.

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Chellamuthu L, Boratne A. Drive-in vaccination against COVID-19 in India. Healthline.2021; 12(4) : 100-102 .
	DOI : 10.51957/Healthline_289_2021	

Individuals must have their identity proof and a mobile phone for verification at the time of their visit. After getting vaccinated, people can park their vehicle and wait for a period 30 minutes. If someone feels uneasy, they can turn on the hazard light or honk to alert healthcare workers, who will come to assist. The healthcare team will be equipped with emergency first aid and anaphylactic kit which is usually advised for outreach immunization sessions.

In some states, such as Maharashtra and Uttar Pradesh, drive-in vaccination centres have been instituted in an attempt to speed up the vaccination campaign and make it hazzle-free.[7–9] This novel vaccination approach is a safe and efficient way to vaccinate a large number of people within a short period of time while maintaining social distance. This also makes it easier and more comfortable for the elderly, patients with co-morbidities or chronic diseases and differently abled individuals to receive vaccines without any difficulty that is involved in accessing the conventional vaccination sites.

Experiences in drive-through health care service models

Immunization

Drive-in vaccination began at first in the United States more than 20 years ago, and have been repeated yearly ever since during the flu season. Moreover, it has already been followed in some countries, but almost exclusively for mass vaccination against seasonal influenza. Drive-in vaccination proved effective in immunizing local communities in those situations.[10]

Drive-in vaccination has become more popular during the current COVID-19 pandemic and is being adopted in several countries. For instance, the Australian government has drawn up guidelines in terms of logistics, pre-vaccination arrangements (appointments, anamnestic assessment), safety precautions and emergency equipment for their general practitioners who choose the drive-through option for seasonal influenza vaccination. [11]

The European health authorities endorsed drive-through vaccination against measles-mumps rubella and papillomavirus for adolescents during the summer in this Covid pandemic. This indicates that, despite the relatively few drive-through sites available (in comparison to the more numerous ambulatory facilities) and the travel distances involved, the drive-through modality has not only proven to be a safe means of ensuring service continuity during a milder phase of the Covid pandemic, but also has users' approval.[12]

Since June 2020, owing to the pandemic in Italy, the drive-through modality enabled more than 100 people per session (3 - 3.5 hours) to be vaccinated against tick-borne encephalitis with only three nurses and one doctor. In contrast, the current norms on social distancing and sanitization of the room after each one getting vaccinated would have allowed only one person to be vaccinated every 15 minutes in a traditional vaccination site. There had been no significant adverse events, and public demand had steadily increased, proving the "drive-through" approach to be safe, efficient, and successful during this challenging pandemic times.[13]

Screening or testing of the disease

Drive-through screening centres have been designed and implemented in Korea for safe and efficient COVID-19 screening. Registration, examination, specimen collection, and instructions are all steps in the drive-through screening process. The entire service takes about 10 minutes for one person without coming out of their cars. Increased testing capacity, prevention of cross-infection between individuals in the waiting space and decreased vaccine hesitancy among the public are the major advantages.[14]

Dispensing of medicines

A drive-through model for dispensing medications was established in Hawaii during April 2005. With minimal human contact, 622 patients were evaluated at a rate of 5.2 persons per minute

over the two-hour session. Local health administrators, particularly in rural regions, were shown to be able to facilitate healthcare services and decrease mortality during a public health emergency with provision of drugs. This model also revealed that drive-throughs are beneficial for both screening and outpatient treatment in both rural and urban settings. Furthermore, this model aid in rapid scaling of capacity and service delivery as the demands on individual health systems and communities varies.[15]

Conclusion:

The drive-throughs have been innovatively used for COVID-19 vaccination in certain parts of the nation, as the pandemic and our response to it evolves, the same models could also be employed for screening or testing of COVID-19 and for dispensing of COVID-19 medications with authorized prescriptions. The implementation of these newer strategies for delivering healthcare services in all statesand transformation of such approaches according to the individual state's situations to cope with the COVID-19 pandemic are proven to be successful.

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