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Editorial

Poshan Pakhwada 2023: A Strategic Innovation to Combat India's Malnutrition Challenge

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Adequate nutrition is essential for our physical and mental growth and development. It forms the foundation of our very existence, as it impacts health outcomes in every stage of life. The importance of nutrition is well recognised in the United Nations, Sustainable Development Goal (SDG)-2 as "Zero Hunger" which aims to promote food security for all and end hunger and all forms of malnutrition by 2030. Nutrition is also the key to attainment of other SDG's as well, with 12 of the 17 SDGs having indicators relevant for nutrition.^[1]

India accounts for almost 1/3rd of the global burden of under-nutrition. Considering, India's population size, investing in actions to reduce all forms of malnutrition is especially important, not just for India itself, but also to support the attainment of global targets.^[2]

Nutrition, has special relevance for children and women, as it has a series of implications for the overall social and economic development of the nation. Nearly every third child in India is undernourished – underweight (32%) or stunted (35.5%) and every fifth child (19%) is wasted as per NFHS-5 (2019-21). Moreover, 2 out of every 3 child (67%) and every second pregnant women (52%) is anaemic as per NFHS 5.^[3]

Government of India, has always accorded highest priority to the issue of malnutrition and is committed to ensuring that every child, adolescent girl and woman attains optimal nutritional status. A number of schemes with direct/indirect effect on nutritional status of children (0-6 years age), pregnant women and lactating mothers have been launched over the last few decades, but haven't been able to achieve desired change in nutritional status and the progress has been very slow. Some of the possible reasons being lack of synergy between various schemes, lack of community participation and ownership, issues with regards to funding and capacity building of staff and strengthening of infrastructure. POSHAN Abhiyaan, launched by Prime Minister Shri Narendra Modi in Jhunjhunu, Rajasthan in March 2018,is India's Flagship programme that identifies and seeks to address the following key essential components critical in the fight against malnutrition.^[4]

- Delivery of high impact interventions, including behaviour change communication (BCC)
- 2. Multisectoral convergence
- 3. Adequate financing (setting up a three year budget of Rs.9046.17 crore)
- 4. Monitoring to track progress and learn
- 5. Leveraging technology

It is an overarching framework that seeks to create synergy, leverage funds, functionaries, technical resources and IEC activities from existing programs and schemes such as the Integrated Child

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Development Services (ICDS), Pradhan Mantri Matru Vandana Yojana (PMMVY), National Heath Mission (NHM), Swacch Bharat Mission (SBM), National Rural Livelihood Mission (NRLM), National Rural Employment Guarantee Assurance (NREGA) and the Public Distribution System (PDS). The idea is multiministerial convergence to align efforts of every stakeholder in a direction that could positively impact holistic development and adequate nutrition.

It also intends to convert Nutrition Awareness into a "Jan Andolan" i.e people's movement with involvement of Panchayati Raj Institutions/Village Organizations/SHGs etc. and ensuring wide public participation. PoshanPakhwada, a fortnight-long campaign held in March, is a major outreach and social & behaviour change campaign undertaken under the Jan Andolan component of POSHAN Abhiyaan with astounding reach and results. It includes a conglomeration of activities like Poshan Melas, Rally on nutrition, Prabhat Pheree, Session on nutrition at schools, Self-Help Group meetings, Anaemia camps, growth monitoring of children, home visits of newborn babies by ASHA/AWW, Village Health Sanitation and Nutrition Day (VHSND) Community Based Events (CBE) etc. Every year an issue pertaining to adoption of healthy Nutritional Behaviours is to be undertaken to sensitize masses and seek their active participation making it a people's movement. Ministry of Women and Child Development has been identified as the nodal ministry for coordinating the conduct of activities with other departments. These activities are compiled at the Block/District/State level on daily basis and updated on the Jan Andolan Dashboard at www.poshanabhiyaan.gov.in.

Poshan Maah (September) and Poshan Pakhwada (Fortnight in March) are nationwide nutritioncentric annual Jan Andolans that seek to encourage community participation and mobilise people to promote a healthy and nutritious diet to curb malnutrition among children and women.^[5]

Poshan Pakhwada: Combating Malnutrition In India...

The 5th Poshan Pakhwada themed 'Nutrition for all: Together towards a healthy India' was observed from 20thMarch 2023 to 3rd April 2023. The objective was promotion of "shree anna" for food diversity, creating an environment of competitiveness for good health and nutrition and to strengthen and upgrade Aangan Wadi Centres (AWC).

Poshan Pakhwada 2023 - Key initiatives

- Promotion and popularization of Shree Anna/millets for nutritional well being
- Celebration of Swastha Balak Balika
 Spardha
- Popularize Saksham Anganwadi.

Promotion and popularization of "shri anna" or the best of all grains i.e. Millets. They are traditional nutritious small-seeded staple foods grain, that once accounted for about a third of India's food basket. It includes pearl millet (bajra), finger millet (ragi) and sorghum (jowar) being most popular ones. Green Revolution with emphasis on production of staple crops such as rice, wheat and maize is believed to have eliminated food diversity and reduced the importance of millets in our farms and plates.

Millets are now recognized as smart foods - that are "good for health," "good for the planet," and "good for the farmer,". The year 2023 is the International Year of Millets, that seeks to increase the attention and interest for millet consumption, push for global cooperation to promote millet in various ways.

Swastha Balak Balika Spardha

Primary beneficiary under this scheme are Children (6 month-3 years and 3-5 years) and secondary beneficiary include Care-givers (i.e. Parents, Other Family Members, Other local persons) comprise the secondary beneficiary. The initiative involves cooperation & joint efforts by ICDS staff (CDPO, Supervisor, AWW/AWH), Local PRI representative / Ward members, Health Staff (PHC-MO/ANM/ASHA), Local School Teachers, SHGs, NGOs (Organizations like Lions Club, Rotary Club)

Advantages of Millets

- Superior Micronutrient profile and bioactive flavonoids compared to other cereals
- Low Glycaemic Index and also associated with the prevention of diabetes.
- Good source of minerals like iron, zinc, and calcium.
- Gluten-free and can be consumed by Celiac disease patients.
- Beneficial effect on management and prevention of hyperlipidemia & risk of CVD.
- Helpful in the reduction of weight, BMI, and high blood pressure.
- Consumed with legumes in India, they supplement protein, increase the amino acid content, and enhance the overall digestibility
- Millet based value-added products in ready to cook, ready to eat category are easily accessible and convenient to the urban population.
- Can be used as food as well as fodder, which make it more farming efficient.



Source: Agricultural & Processed Food Products Export Development Authority (APEDA), Government of India.^[6]

Millets Health Benetits

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Poshan Pakhwada: Combating Malnutrition In India...

The objectives of this initiative are to

- 1. Bring focus on the "Swastha Balak Balika-Healthy Child"
- Identify healthy children in age group of 6 months to 3 years and 3 to 5 years -on objective marks based criteria
- Generate awareness and conduct campaigns for growth measurement of children under 5 years
- 4. Generate a spirit of competitiveness for good health and nutrition
- 5. Promote Breastfeeding and Complementary feeding practices
- 6. Promote counselling regarding importance of diet diversity and age appropriate feeding
- Promote concept of peer educator (motherto-mother/family/community)

The event is to be celebrated with distribution of Certificate to Winning Child and Parent (especially mothers, to encourage spirit of positive competition) and reward like indigenous toys, hygiene kit, water bottle, fruit basket etc. Small gifts like nutrition kit/ hygiene kit to all participating children.^[7]

Saksham Anganwadi:

Government of India in the financial year 2021-22, restructured the Integrated Child Development Services (ICDS), POSHAN Abhiyaan and the Scheme for Adolescent Girls (SAG) into Mission Saksham Anganwadi and Poshan 2.0, also known as Poshan 2.0.^[8]

Poshan 2.0 seeks to focus on Maternal Nutrition, Infant and Young Child Feeding Norms, Treatment Protocols for SAM/MAM and Wellness through AYUSH practices to reduce wasting and under-weight prevalence besides stunting and anemia, supported by the 'Poshan Tracker', a new, robust ICT centralised data system which is being linked with the RCH Portal (Anmol) of MoHFW. Poshan 2.0 aims to redress some of the challenges identified with the existing schemes including inadequate nutrition quality and delivery, weak community ownership, poor implementation, the absence of an integrated approach to nutrition security, and an insufficient focus on diet diversity, traditional wisdom in nutrition practices, and behaviour change to promote practices that nurture health, wellness and immunity through a 5 year roadmap.

Five Year roadmap - Poshan 2.0

- ⇒ Short term (6-12 months)- Focus on Aadhaar seeding of eligible citizens, resource readiness of Anganwadi Centres (AWCs), governance including setting up of District Nutrition Committees and Poshan Panchayats, promoting dietary diversity, and robust data management.
- ⇒ Medium term (1-3 years)- the scheme plans to strengthen convergence, frontline worker capacity, diet diversity through Poshan Vatikas, and Behaviour Change Communication campaigns.
- ⇒ Long term (3–5 years)- Upgrade 2 lakh AWC's as Saksham Anganwadis and construct pucca AWC's in lieu of semi-pucca and rented AWC's, and foster proactive community ownership of the programme.

The restructured mission consists of the following sub-schemes:

- Nutrition Support by Supplementary Nutrition Programme (SNP) for children (6 month - 6 years), pregnant women, lactating mothers and adolescent Girls (14-18 years)
- 2. Early Childhood Care and Education [3-6 years] and early stimulation for (0-3 years)
- 3. Upgrading Anganwadi Infrastructure Saksham Anganwadi
- 4. Poshan Abhiyaan

Poshan 2 leverages on technology to strengthen nutrition delivery systems. The 'Poshan Tracker' application rolled out by MoWCD on 1st March 2021, is for dynamic identification of stunting, wasting, under-weight prevalence among children and last mile tracking of nutrition service delivery. It will enable real-time monitoring and tracking of all AWCs, AWWs and beneficiaries on defined indicators. Beneficiaries will be Aadhaar seeded to ensure last mile tracking and delivery of services. Poshan Tracker will help Mission Poshan 2.0 in generating data, providing feedback to Program Managers and documenting the impact of scheme on nutrition indicators. The Ministry/ States/ Districts will be able to make effective and timely interventions based on the data, thereby facilitating continuous evaluation and the progress of different components.

Other Initiatives :

Poshan Panchayats with women in leadership roles and with mandatory representation of vulnerable communities seeks to transform the current model of Jan Andolan into Jan Bhagidari for a Kuposhan Mukt Bharat. Poshan Panchayat offer an excellent platform to discuss reasons for malnutrition specific to their jurisdiction and facilitate necessary community/social support mechanism.

Poshan Vatikas are kitchen or nutri-gardens at or near Anganwadi Centres, and in Government schools and Gram Panchayat lands. The innovation seeks to rope in adolescent girls and Below Poverty Line (BPL) women to manage the Vatikas. The idea is to inculcate collective ownership, collective responsibility and community co-operation. The garden will also enhance knowledge of school children on plants and their growth process. Anganwadi Workers have a big role in counselling the beneficiaries to sensitize them on importance of a Nutrition Garden, nutritional value of fruits and vegetables, their importance in healthy and balanced diets and consequences of their deficiencies.

Best Practices under Poshan 2

Mission Sampurna Poshan-Asifabad, Telangana:

It is a success story of behaviour change resulting in inclusion of millet consumption in diet by 80% of beneficiaries. A series of 33 Food Festivals, 10 Millet recipe trainings were conducted covering 225 Anganwadi. Millet recipes, cooking videos in local language were circulated, Anganwadi workers made door-to-door visits daily to monitor healthy food intake, subsidized millet seeds were distributed to 2500 households on a pilot basis.

Mera Bachccha Abhiyaan Model -Datia, Madhya Pradesh:

Intensive weighing campaigns of children 0-5 years every 3 month were done to identify malnourished children. The highlight of the Abhiyan was the Adopter who took the responsibility of nurturing the SAM child through regular interventions with the family of the child

Project Sampoorna in Bongaigaon, Assam:

Introduced the concept of of 'Buddy Mothers', wherein two mothers form a pair, one with a healthy child, the other with a malnourished child. They exchanged best practices and worked on diet charts to monitor the daily food intake of their children. The local Government arranged for milk and egg on alternate days for all identified children for the first 3 months.

Conclusion:

As per the Global Nutrition Report 2022, India is 'on course' to meet the targets of maternal, infant, and young child nutrition (MIYCN), childhood overweight, and childhood stunting, However considerable progress is needed to meet the target of childhood wasting or anaemia reduction among women of reproductive age.^[9]

The beauty of Poshan Pakhwada, is convergence of various government departments, civil society organizations and private sector to address a multitude of issues having a bearing on health of

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mothers and children and working on alternative solutions. Poshan Pakhwada have been successful in catalysing peoples involvement in discussion and adopting healthy nutrition habits. There have been various innovations combining tradition and nutrition to catch people's attention, shattering gender stereotypes, setting up a competitive spirit organising red carpet celebrations for babies. However, there are challenges continuing with the momentum beyond the fortnight, capacity building of frontline workers, tracking and ensuring appropriate care for those with any form of malnutrition. A strong political commitment and leverage on technology like Poshan Tracker are the strengths of the program that can take care of keeping up the momentum beyond the campaign fortnight. Thus, to conclude Poshan Pakhwada targeting on behaviour change in community and promoting healthy, nutritious diet via Jan Bhagidari and Jan Andolan and strengthening nutrition delivery systems seems to be an appropriate strategy with long term impact and setting the way for a Malnutrition Free – Healthy India.

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Barriers and Solutions Pertaining to Pradhan Mantri Matru Vandana Yojana (PMMVY) Implementation in A Block of West Bengal: A Mixed-Methods Approach

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Abstract:

Introduction: Improvement of maternal health care services will not only put a positive impact on maternal health, but also on the health of the new born. Objectives: This study was conducted to estimate the proportion of eligible beneficiaries who received the benefits provided by the scheme, to identify the barriers faced by the beneficiaries and health providers related to the scheme and to find possible solutions to overcome the barriers found as suggested by them in a block of West Bengal. Method: A cross-sectional study with sequential explanatory mixed-method approach was conducted in a block of West Bengal from January-December 2021. Quantitative data was collected from the digital portal of PMMVY. All beneficiaries who had their Last Menstrual Period (LMP) on and after 1st March 2020 up to 31st December 2020 were included. To identify the barriers faced and suggest possible solutions, Focused Group Discussions (FGDs) were held with the beneficiaries, ANMs and ASHAs and Key-Informant Interviews (KIIs) with the Block Medical Officer and Data Entry Operator. Data were analyzed using SPSS version 25.0. Descriptive statistics were used to summarize quantitative data while qualitative data were analyzed in the form of themes, codes and verbatim. Results: Total eligible beneficiaries for the three installments were 1066, 917 and 708 respectively. About 95.5% beneficiaries received the first installment, 93.0% received the second and 98.3% had received the third installment. The broad themes [codes] generated from the FGDs were challenges during antenatal care [ANC refused, home visit preferred, home ANC difficult, lockdown], challenges related to the PMMVY scheme [documents unavailable, incomplete forms, payment issues], possible solutions [prepare pre-requisites beforehand, provide cash]. Widely two main themes emerged from the KIIs: Form related issues and Payment issues. Conclusion: Coverage of PMMVY scheme in the block was satisfactory. However, speeding the payment process and stricter monitoring of the scheme is required.

Keywords: Antenatal Women, Benefit, Cash Transfer, Maternal Health Program.

Introduction:

The Pradhan Mantri Matru Vandana Yojana (PMMVY) is a maternity benefit transfer scheme launched by the Government of India in 2017 under the Ministry of Women and Child Development. It aims to incentivise nutrition and health-seeking behaviour and provide cash benefits to pregnant and lactating women for their first live birth.^[1]

The PMMVY scheme transfers benefit through Direct Benefit Transfer to improve efficiency and reduce leakage within the scheme. A total incentive of INR 5000 in three instalments (1000, 2000 and 2000) is credited directly into the beneficiary's bank account or post office account upon verification of the prerequisites. Registration of pregnancy within 150 days from the start of pregnancy as specified on

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the Mother and Child Protection (MCP) card is required for the first instalment. For the second, receipt of at least one antenatal check-up within six months of pregnancy must be shown and registration of childbirth along with receipt of the first round of immunisations is needed for receiving the third instalment. The account must be in the name of the female beneficiary and not a joint one. Also, the account must be linked to Aadhar, that is the Unique Identification Number issued by the Government of India to all citizens. This ensures that the lady has greater power over expenditure related decisions on the money.^[2]

West Bengal has a Maternal Mortality Ratio (MMR) of 103 as per Sample Registration System (SRS) 2020and is still striving hard to reach the Sustainable Development Goals target of less than 70.^[3] In spite of a number of programmes for maternal health, our country still suffers from the problem of maternal morbidities and mortality. Some of the factors contributing to poor maternal and child health are poverty, inadequate nutritional intake during pregnancy, low awareness of ante-natal care including various benefit schemes and limited access to reliable healthcare. Further, owing to economic and social distress many women continue to work to earn a living for their family right up to the last days of their pregnancy and return to work shortly after childbirth.^[4] According to the recent National Family Health Survey-5 survey, only 73.8% women received at least 4 Antenatal Checkupsin their last pregnancy in rural areas of West Bengal.^[5]

There is considerable global evidence on the effectiveness of cash transfers in improving health and nutrition outcomes; however, the evidence from South Asia, particularly India, is limited.^[6] The PMMVY scheme has been under implementation in West Bengal since its launch where it is known as Bangla Matri Prakalpaand is under the Department of Health and Family Welfare. Improvement of maternal health care services will not only put a positive impact on maternal health, but also on the health of the new born.^[7] Compared to studies on other maternal health programmes, very scarce literature is available on PMMVY, even though this is one of the most important on-going maternal health

programmes. With this background, study was conducted mixed-methods approach in a block of West Bengal to estimate the proportion of enlisted beneficiaries who received the benefits provided by the scheme, to identify the barriers faced by the beneficiaries and health providers related to scheme and to find possible solutions to overcome the barriers found as suggested by them.

Method:

It was an observational study, cross-sectional in design following explanatory sequential mixedmethods approach. The study was conducted in Budge-II block of South-24 Parganas district, West Bengal for a period of twelve months (January 2021 to December 2021).

The quantitative strand of the study was conducted by collecting secondary data from the digital portal of the PMMVY scheme. All beneficiaries who had their Last Menstrual Period (LMP) on and after 1st March 2020 upto 31st December 2020were included. For the qualitative strand, eight Focused Group Discussions (FGDs) were conducted, four with the beneficiaries who had been enrolled into the scheme but had not received the first installment, two others including Public Health Nurses (PHNs). The Block Medical Officer (P1) and Data Entry Operator (P2) were also interviewed. These health care workers were important stakeholders directly related to scheme related activities in the area.

For the quantitative strand, total enumeration was done. Data of a total of 1066 beneficiaries was taken from the PMMVY_Common Application Software (PMMVY_CAS) portal. Participants for qualitative part were selected purposively. Eight FGDs were held with 32 beneficiaries, 16 ANMs, 16 ASHAs and two Key Informant Interviews (KII) were conducted with the Block Medical Officer and Data Entry Operator.

A pre-designed, pre-tested, structured data abstraction form was used for quantitative strand. Focused Group Discussion (FGD) guide and Key Informant Interview (KII) guide were used for the qualitative strand. The content validity of the data abstraction form and guides were evaluated by public health experts. Quantitative data were collected from details of beneficiaries from the digital portal of PMMVY and entered into the form. Three FGDs comprising of 8 beneficiaries each were planned initially. One beneficiary was selected from each subcenter and was invited for the discussion on monthly meeting days. Later, one more FGD was conducted after which data saturation was observed. Among ANMs and ASHA, initially four FGDs were planned (two with ANMs and two with ASHAs). Three FGDs were conducted in the sequence- ANMs, ASHA and ANMs after which similar responses were recorded. Hence the last FGD was conducted as planned and no more seemed necessary.

FGDs and Interviews were conducted in the Rural Health and Training Centre (RH&TC) and each of them lasted for around 20 minutes. The study variables were broadly dependent variables and independent variables; Dependent variables: Payment of 1^{st} , 2^{nd} and 3^{rd} installment where as Independent variables:Socio-demographic variables, pregnancy and scheme related variables,

Domains under qualitative strand: Challenges faced during antenatal care of woman, problems in enrolment in PMMVY scheme, reasons for return of forms back to the sub-center, payment related issues and solutions to those barriers

Quantitative data were tabulated in Microsoft Excel 2019 (Microsoft Corp, Redmond, WA, USA) and then imported to Statistical Package for the Social Sciences (SPSS for Windows, version 25.0, SPSS Inc., Chicago, USA) for interpretation and analysis. Descriptive statistics were used to summarize the data. Qualitative data were first transcribed into Microsoft Word 2019. Atlas.ti version22 software was used for coding. Final representation of data was tabulated as themes, codes and verbatims.

Institutional Ethics Committee permission was obtained prior to start of the study (Institute name/IEC/2021/130 dated 06.02.2021). Informed written consent was obtained before each Focused Group Discussion and interview and all ethical principles were strictly adhered to throughout the course of the study.

Results:

Profile of the beneficiaries:

A total of 1066 beneficiaries were found. All 1066 beneficiaries were claimants of first installment (Form 1A), while 917 beneficiaries were eligible for the second installment (Form IB). Out of 1066,708 beneficiaries had submitted Form 1C for third installment as they had completed their pregnancy and delivered. The mean age of the beneficiaries at the time of provision of Maternal and Child Protection (MCP) Card was 21.4±1.5 years with a range of 19 to 26 years. About 78.4% were Hindus, 84.3% belonged to General category and 17.7% to Other Backward Classes (OBC). About 99.4% of the beneficiaries were in their first pregnancy (primigravida). Out of 708 beneficiaries who had delivered, nearly 40% of the deliveries took place at private nursing homes. The delivery hub distance was less than 5km from their residence in only 16.9% beneficiaries. Average duration between Last Menstrual Period (LMP) and date of pregnancy registration was 94 ±22 days. Average duration between date of pregnancy registration and entry into the scheme was 28±10 days.

Figure 1 shows distribution of the beneficiaries according to the different installments they had received. A total of 1018 (95.5%) of the beneficiaries had received the first installment, 853 (93.0%) had received the second and 696 (98.3%) had received the third installment.

Reasons for non-receipt of installments by the beneficiaries are shown in Table 1. Most common reason for non-receipt of first installment was 'Aadhar not linked to bank account' while for second and third installments it was 'rejected by bank, as account number is invalid.'

Data from the Focused Group Discussions were analyzed thematically in Table 2 and 3. The broad themes were challenges during antenatal care, barriers related to the PMMVY scheme, possible solutions and thoughts on the scheme.

Widely two main themes emerged from the Indepth interviews: Form related issues and Payment issues.

Table 1 : Reasons for not receiving Installments $(n_1=48, n_2=64 \text{ and } n_3=12)^*$				
Installment	Reasons for not receiving Instalments	n (%)		
1 st installment (Rs 1000)	Aadhar not linked to bank account	16 (33.3)		
	Beneficiary name does not match with Aadhar	11 (22.9)		
	Beneficiary created based on UID but account is blocked	8 (16.7)		
	Husband's name does not match with Aadhar	6 (12.5)		
	Customer refer to branch (Beneficiary needs to provide	4 (8.3)		
	correct documents in the branch)			
	Beneficiary's Aadhar is suspended	1 (2.1)		
	Husband's Aadhar is suspended	1 (2.1)		
	Rejected by bank, as account number is invalid	1 (2.1)		
2 nd instalment (Rs 2000)	Rejected by bank, as account number is invalid	19 (29.7)		
	Customer refer to branch (Beneficiary needs to provide	15 (23.4)		
	correct documents in the branch)			
	Beneficiary name does not match with Aadhar	14 (21.9)		
	Husband's name does not match with Aadhar	7 (10.9)		
	Aadhar not linked to bank account	6 (9.4)		
	Beneficiary's Aadhar is suspended	2 (3.1)		
	Husband's Aadhar is suspended	1 (1.6)		
3 rd installment (Rs 2000)	Rejected by bank, as account number is invalid	9 (75.0)		
	Customer refer to branch (Beneficiary needs to provide	3 (25.0)		
	correct documents in the branch)			

 $^{*}n_{_{2}}$ and $n_{_{3}}$ are subsets of $n_{_{1}}$

Table 2 : Thematic analysis from the FGDs with the Beneficiaries (n=32)

Themes	Codes	Verbatims		
A. Barriers related to PMMVY scheme	1. Lack of awareness	"know that mother gets money on delivery but don't know about the scheme."		
	2. Documents not	"don't have Aadhar card"		
	avallable	"Aadhar card is on my surname before marriage."		
	3. Bank account	"don't have bank account on my name"		
	4. Payment related issues	"I did not get money but from office they said money has been sent."		
B. Possible solutions	1. Pre-requisites for payment	"ASHA should tell us soon after marriage about updating Aadhar details."		
		" bank account with surname before marriage should be allowed for receiving payment."		
	2. Provide cash instead of bank	"they can give cash."		
	transfer	"we will be less harassed"		

Themes	Sub-themes	Verbatims
A. Challenges	1. Refused by lady	"Pregnant ladies in my area say their husbands/families don't allow them
during		to go outside"
Antenatal		"They prefer to spend their antenatal period at home and be looked after by
care		elder ladies at home and neighbourhood"
		"One lady, after coming to know she is pregnant, refused to get registered."
	2. Home visit	"Some ladies prefer antenatal check-up at home."
	preferred	
	3. Home visit	"It is not possible to do check-up at home. We have other work at sub-centre.
	difficult	Home visits take time."
		"We have to travel great distance on foot to visit their homes"
		"It is difficult to carry the weighing machine all the way to the house of
		the pregnant lady."
	4. Lockdown	"Aadhar updating centres are far and the ladies could not travel."
		"Payment was delayed during lockdown.
	5. Non-compliance	"They don't take IFA tablets regularly due to acidity problem."
	to medicines	"They don't come on time for ANC."
	and others	" don't come on the 9 th of every month even after repeated reminders."
B. Barriers	1. Problem	"They don't have Aadhar card and other ID proofs."
related to	with	"Sometimes the Aadhar card has the maiden name and address."
PMMVY	documents	"Many don't have bank account in their own names."
scheme		"Some bank accounts are not linked with Aadhar."
	2. Incomplete	"Forms cannot be filled up if relevant documents are not available."
	forms	"I joined a few months back. The in-charge before me did not fill the forms
		properly and did not submit required documents. Now the lady has come to me.
		Her LMP date has crossed beyond the eligibility criteria."
	3. Payment	"The bank says money credited. But the lady says she did not receive any money."
	related issues	"Many times, the payment gets credited to the account which they used prior to
		marriage as that is linked to Aadhar."
		"Some ladies have doubted that we have taken their money."
C. Possible	1. Pre-requisites	"Ladies should change their Aadhar details soon after marriage."
solutions	for payment	"Create new bank account in their own name soon after marriage."
		"Every bank account should be allowed for receiving payment."
	2. Provide cash	"Providing cash instead of bank transfer is better. The lady can immediately
	instead of bank	get the money and use it during her pregnancy."
	transfer	"Payments should not be delayed."
D. Thoughts	1. Beneficial	"It is a very good scheme. It provides money to some very poor women
scheme	scheme	who don't have enough to eat."
	2. Unsatisfactory	"The objective is to provide money to the woman so that she can eat well and
		Improve her nutritional status. But this is not happening. Because the payment
		takes time the lady is unable to utilize it."
		"Sometimes, by the time a lady receives the money her pregnancy is nearly over."
		"ASHA workers should get some incentive per beneficiary."

Table 3 : Thematic analysis from FGDs with ANM and ASHA (n=32)



Figure 1 : Distribution of the beneficiaries according to the different Installments they had received $(n_1=1066, n_2=917 \text{ and } n_3=708)$ *

* n_2 and n_3 are subsets of n_1

Form related issues:

P1 said, "We believe in team work. We take feedback and discuss all problems during the monthly meetings."

P2 mentioned, "We don't accept incomplete forms. Data is uploaded only from complete forms. Whenever there is a cue, we immediately contact the sub-center and send back the forms for revision or change of any documents."

Payment related issues:

According to P1, the delay in receiving benefits of this scheme is less than other schemes. "...Bangla Matri Prakalpa is going fine. Little bit problems occur in all schemes. We ensure the cues are resolved immediately so that the beneficiary can utilize the money."

P2 pointed, "One reason why payment has been delayed this particular year is COVID-19. But usually, the payment is not so delayed if correct documents are provided."

P2 also stated that the beneficiaries report nonreceipt of payment even through the portal shows "paid". According to him, "There may be political reasons as to why the scheme is not fully covered in some areas of West Bengal. It may be because this national programme is known as Bangla Matri Prakalpahere."

P2 continued, "We are often blamed by the beneficiaries for taking away their payments. This saddens us a lot. We want to help them and we are doing our duties sincerely."

P2 expressed that providing cash incentives instead of digital mode of money transfer may be opted for schemes targeting maternal health. ".... Although digital mode of payment is better, in this case cash can be given. To ensure no wrong doings, they can keep accounts of the cash disbursed."He also felt, "Money provided in this scheme is inadequate."

Discussion:

Over the years, India has implemented several programmes to overcome the issue of poor maternal and child health. The PMMVY is another milestone Programme having similar objectives. However, it has not been successful in covering 100% of its beneficiaries. An article by Gautam A has elaborated the ground reality of the scheme, from its implementation to its execution including highlighting the challenges being faced by the authorities and the beneficiaries. According to him, the scheme has not been able to capture the exact number of mothers under it. The challenges stated by him are corroborative to our findings such as slow process since its launch, delay in verification process, no integration between Financial Management System and Aadhar, lack of monitoring and delay in disbursement of payments. Another striking resemblance with his article is the fact that the Programme lacked objectives to evaluate quality care to the mother.^[8]

As already stated, there is a scarcity of studies on coverage of PMMVY scheme. The findings of the present study were compared with studies involving evaluation of other cash transfer schemes. One such Programmeis the Janani Suraksha Yojana (JSY) aims to accelerate institutional deliveries. Unlike PMMVY which is for all pregnant women and lactating mothers, JSY focuses on poor and marginalised women. This study found over 93% of the beneficiaries had received all three installments. An assessment of JSY utilization in selected districts of West Bengal by Mukhopadhyay*et al.* revealed 96.3% of scheme coverage among the eligible beneficiaries.^[9]

The Mamata Scheme, a cash transfer scheme in Odisha, provides wage compensation to working mothers. The scheme provides mothers with INR 5000 via two installments, each installment on fulfilling certain requirements. In these aspects, the PMMVY closely resembles the Mamata Scheme.^[10]

The PMMVY scheme also complements Janani Sishu Suraksha Karyakram (JSSK) which aims at "zero out of pocket expenditure" with objectives to abolish financial obstacles for the mother and overall improving maternal health. Mitra *et al.* conducted a similar mixed-method study on utilization of JSSK in Gangajalghati block of Bankura district, West Bengal reporting only 20.5% utilization of services by the beneficiaries.^[11]

One noticeable finding in the current study was the high number of deliveries conducted in private nursing homes. This was an unexpected finding concerning the rural setting of the study. Also, what is more striking is the far distance of the delivery hub (>5kms) in nearly 83% of the deliveries.

It was also observed that receiving the previous installment did not always pave the way to easy receipt of future installments. Even if the lady has received the first installment and all her details are available in the portal, she might again have to go through the whole Aadhar-bank link verification process. In this study, high number of non-receipts of the second installment might be due to the fact that the beneficiaries provided a different bank account number, not linked to Aadhar. Another pre-requisite for the benefits is verification of husband's documents. This may not be made mandatory as the programme has the objective to incentivize only the mother.

'The Focused Group Discussions revealed several barriers pertaining to antenatal care. One such is the resistance that the lady faces from her home where either her husband or in-laws don't allow her to go outside. This is one of the major reasons why India still does not report high antenatal care coverage. Many ladies prefer home visits, but this is not always feasible and practicable.

On payment issues, similar difficulties were reported faced from all sub-centers, that is, the beneficiary has only one bank account usually made before her marriage which is linked to Aadhar. This is why the most common reason for not getting the payment was Aadhar linkage issues with the bank account. Also, the fact that many beneficiaries have accused the health care providers for taking away their money, points towards low awareness and trust on such schemes.

Limitations:

Utilization of the benefits was not focussed upon in the study. Also, we did not evaluate any significant delay in receipt of the payments from date of enrolment.

Conclusion and Recommendations:

Coverage of PMMVY scheme in the block was satisfactory. Problems faced by beneficiaries in not getting their due payments were mainly Aadhar and bank account related. Challenges faced by the ANMs and PHNs were non-availability of documents of beneficiaries and as a consequence incomplete form fill up.

For bank account name related issues, either ladies should be encouraged to get their names changed/updated soon after marriage or all her bank accounts should be allowed for receiving payment. Payments should not be delayed so that the lady can use the much-needed money during her pregnancy period. Also, access to the PMMVY portal should be given to the beneficiaries (preferably as beneficiary login ID) to check her payment status from time to time.Based on the study findings it may be suggested thatverification of husband's Aadhar should not be kept mandatory, if possible.Last but not the least, intensive community-based awareness campaigns about the scheme and widening its scope across the nation is also strongly recommended.

Declaration:

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Glycemic Control and Its associated Determinants among Type II Diabetic Patients at Tertiary Care Hospital in North India

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Abstract:

Introduction: Good glycemic control has been defined as achieving a target of fasting plasma glucose level of between 80 and 110 mg/dl, or glycosylated haemoglobin (HbA1C) of <7.0%. Poor glycemic control is highly correlated with chronic conditions related to the damaging effects of hyperglycaemia, resulting in serious complications. To restrict and delay the complications of diabetes mellitus, good glycemic control is essential. **Objective:** To identify the determinants associated with poor glycemic control among Type 2 diabetes mellitus patients. Method: A cross sectional study was conducted among 403 confirmed type 2 diabetic patients who attended one of the tertiary care hospitals of North India over a period of six months (July- December 2021). The collected data was analysed using IBM SPSS version 28. Chi-square test was applied to compare various determinants of glycemic control. A p-value of <0.05 was considered to be statistically significant. **Results:** Out of 403 participants, 57.6% had poor glycemic control of diabetic condition. Higher age of participants, illiteracy, being overweight, having positive history of smoking and alcohol, longer duration of diabetes, participants taking both oral and insulin treatment for diabetes, taking medicine irregularly were the significant determinants of poor glycemic control. **Conclusion:** Higher percentage(57.6%) of poor glycemic control was observed in the study. To improve the glycemic control, efforts should be made towards improving modifiable factors like overweight, smoking, alcohol, regularity of medication etc. Good lifestyle interventions help in control of poor glycemic control.

Key Words : Determinants, Diabetes Mellitus (DM), Glycemic Control (GC), Glycosylated Haemoglobin (HbA1C)

Introduction:

Diabetes mellitus is rising more rapidly in the twenty-first century. Globally, it is affecting about 415 million adults, and it is projected to affect 642 million adults by 2040.^[1] Diabetes, cardiovascular diseases, respiratory diseases, and cancer are the major contributors to the non-communicable disease epidemic. In India, among other non-communicable diseases, diabetes has the greatest increase (39.6%) in the age standardized disability-adjusted life years between 1990 and 2016.^[2] The prevalence of diabetes in India is continuously rising. In 2019, India had the second largest population in the world with diabetes (77.0 million persons living with diabetes), which is expected to rise to 134.2 million persons by 2045. Additionally, a large number (42.2 million, 57.9%) of people living with diabetes in India remain undiagnosed. Diabetes is associated with a significant economic burden. In 2017, India had the fourth highest healthcare expenditure on diabetes in

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the world.^[3] Also, diabetes-related mortality rate in India in 2016 was 3.1% of all deaths, up from 0.98% deaths in 1990.^[4] Between 2000 and 2019, there was a 3% increase in diabetes mortality rates by age. In 2019, diabetes and kidney disease due to diabetes caused an estimated 2 million deaths.^[5] Long-term, uncontrolled diabetes causes metabolic changes and subsequently leads to development of macrovascular and microvascular complications.^[6]

Glycemic control has been defined as achieving a target of fasting plasma glucose level of between 80 and 110 mg/dl, or glycosylated haemoglobin (HbA1C) of <7.0%.^[7] HbA1c is a test that measures the average amount of diabetic control overall period of about 3 months (the average red blood cell lifetime) and used as a significant indicator and marker of glycemic control. Diabetics who manage to keep their HbA1c below 7.0% are considered to have good glycemic control while those above or equal 7.0% are considered to have a poor glycemic control.^[8] Evidence suggests that every 1% increase in the glycated haemoglobin (HbA1c) level in persons living with diabetes is associated with approximately 40% increase in cardiovascular disease mortality and a 30% increase in all-cause mortality.^[9] In contrast, every 1% reduction in HbA1c is associated with reduction in risk of 21% for any endpoint related to diabetes, 21% for deaths related to diabetes, 14% for myocardial infarction, 12% for stroke, 16% for heart failure, 43% for amputation or death from peripheral vascular disease, 37% for microvascular complications, 31% for retinopathy, and 33% for nephropathy.^[10-12]Achieving good glycemic control is a critical metabolic goal because hyperglycaemia contributes to the progression of diabetes mellitus by affecting both ß-cell function and insulin sensitivity.

The objective of the study was to identify the determinants of poor glycemic control among Type 2 diabetes mellitus patients.

Method:

Using cross-sectional study design, this study was conducted in medicine outpatient department of a tertiary care hospital in north India catering patients from both urban and rural areas. The study was conducted over a period of six months i.e., July 2021 to Dec 2021.Type 2 diabetes mellitus patients aged more than 18 years who attended the medicine OPD were included in the inclusion criteria. Type 2 diabetes Patients who were not able to respond to the study tool because of their illness and patients who did not give consent were included in the exclusion criteria.Assuming that 50% population has adequate glycemic control and with 5% absolute error, the sample size is calculated as $n = z^2 p (1 - p) / w^2 = 384$. By considering the 5% nonresponse rate, the sample size was 403, where n = sample size, p = proportion (50%), w= margin error (5%), z = 1.96.^[13]

The study was approved by the Institutional Ethics Committee.A pre-validated pretested questionnaire was developed to fulfil aim of study.It has two sections (A and B). Section A contains general information of socio-demographic variables i.e., age, gender, education, place of living. Section B contains questions related with disease variables i.e., HbA1c, Family history, BMI, Smoking, Alcoholic, Duration of disease, Type of treatment, Regularity of medication.

Personal face to face interviews were conducted. Patients were explained about the purpose of study. Written informed consent was taken and complete confidentiality was ensured. To confirm the clinical profile and treatment schedule, patient's record available with him/her was also referred. Average time of interview per participant was about 20-25 minutes.

Statistical analysis:

The data were entered into the excel sheet and analysed using IBM SPSS version 28.0. Qualitative variables were expressed as proportions and percentages. Quantitative variables were expressed as mean and standard deviation. Chi-square test was used to establish association (if any) among qualitative variables, p value < 0.05 was considered significant.

Results:

A total 403 patients with mean age of 51.4±14.84 years were included in final analysis. Among total, 232(57.5%) participants had poor glycemic control as compare to 171(42.5%) who had good glycemic control.(Figure 1) Around 59.4% offemale

Variables	Good control	Poor control	Total	p value
	(n=171) N(%)	(n=232) N(%)	(N=403)	
Agegroup		1		
<40 years	110 (89.4%)	13 (10.6%)	123	< 0.001
41-60 years	43 (27.2%)	115 (72.8%)	158	
>60 years	18 (14.8%)	104 (85.2%)	122	
Gender		·		
Male	119 (43.3%)	156 (56.7%)	275	0.617
Female	52 (40.6%)	76 (59.4%)	128	
Residence		•		
Rural	101 (44.7%)	125 (55.3%)	226	0.299
Urban	70 (39.5%)	107 (60.5%)	177	
Education		•		
Illiterate	12 (25%)	36 (75%)	48	< 0.001
Primary and Secondary	12 (20.7%)	46 (79.3%)	58	
Higher Secondary	47 (44.3%)	59 (55.7%)	106	
Graduate and above	100 (52.4%)	91 (47.6%)	191	
BMI (kg/m^2)				
<18.5	3 (30%)	7 (70%)	10	< 0.001
18.5-22.9	80 (72.8%)	30 (27.2%)	110	
23-24.9	70 (32.6%)	145 (67.4%)	215	
>25	18 (26.4%)	50 (73.6%)	68	
Smoking		•		
Yes	65 (32.7%)	134 (67.3%)	199	< 0.001
No	106 (52%)	98 (48%)	204	
Alcoholic				
Yes	58 (29.4%)	139 (70.6%)	197	< 0.001
No	113 (54.9%)	93 (45.1%)	206	
Family History		·		
Present	82 (38.1%)	133 (61.9%)	215	0.062
Absent	89 (47.3%)	99 (52.7%)	188	
Duration since diagnosis of Diabet	es			
<5 year	96 (90.6%)	10 (9.4%)	106	< 0.001
6-10 year	59 (60.2%)	39 (39.8%)	98	
11-15 year	6 (6.4%)	87 (93.6%)	93	
>15 year	12 (11.3%)	94 (88.7%)	106	
Type of Treatment at time of study				
Only Oral	159 (93%)	12 (7.0%)	171	< 0.001
Only Insulin	6 (10.5%)	51 (89.5%)	57	
Both	6 (3.4%)	169 (96.6%)	175	
Regularity of Medication				
Yes	165 (51.5%)	156 (48.5%)	321	< 0.001
No	6 (7.3%)	76 (92.7%)	82	

Table 1 : Association of Socio demographic and Treatment Variables with GlycemicControl among Type II Diabetes Patients (N=403)

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participants and 56.7% male participants had poor glycemic control although the difference is statistically insignificant. (p=0.617). Table 1 shows association of socio-demographic and clinical profile factors with glycemic control in type 2 diabetes patients.

The participants(61.9%) who had family history of diabetes had poor glycemic control but results were statistically insignificant.Participants with presence of longer duration of disease 11-15 years (93.6%) had poor glycemic control with results statistically significant (p value<0.001).Participants who were on both insulin and oral treatment (96.6%) and taking medicine irregularly (92.7%) had poor glycemic control of diabetic condition.

Figure 1 : Levels of Glycemic Control among Study Participants (N=403)



Discussion:

In the present study poor glycemic control was found to be among 57.5% of participants. A study conducted by Pushpita De et al in south Indian population 63% patients were having poor glycemic control.^[14] Similar results were observed in previous study conducted by Feleke et al, where poor glycemic control was found to be among 55.3%.^[16]

In the present study participants>60 years of age groups (85.2%) had poor control of diabetic condition. The difference was found to be statistically significant (p<0.001). In the study conducted by Banerjee et al they found that 73.1% participants in 60-80 years of age had poor control of diabetic

condition.^[15] In that study age was found to be a significant risk factor for poor glycemic control in diabetes patients.

In the present study, 59.4% female participants had poor control of diabetic condition. The association between gender and glycemic control were found to be statistically insignificant (p=0.616). The study conducted by Feleke et al mentioned that 67% female participants were having poor glycemic control of diabetic condition.^[16] and the results were statistically significant (p<0.01).

In the study 60.5% participants living in urban area had poor control of diabetic condition. This difference was found to be statistically insignificant (p=0.299). In the study conducted by Banerjee et al, 71.5% rural population had poor glycemic control.^[15] The difference was found to be statistically significant (p<0.001).This may be due to different geographical region of the study.

In the current study, participants who were illiterate (75%) and studied upto secondary education (79.3%) had poor control of diabetic condition as compare to those having higher secondary education (55.7%) and graduation and above (47.6%). This difference was found to be statistically significant (p<0.001).Similar results were observed in a previous study conducted by Banerjee et al found that who were educated from VI and above levelhad good control of diabetic condition than illiterate.^[15] This difference was found to be statistically significant. The possible explanation for this state of affairs might be inadequate knowledge on treatment protocols, inactivity and poor diet among things.In another study conducted by Goudswaard et al, it was found that lower level of education was associated with poor glycemic control and the relation was found to be statistically insignificant (p=0.015).^[17]

In this study participants who were having obesity (73.6%) and were overweight (67.4%) had poor control of diabetic condition. This difference was found to be statistically significant (p<0.001). In the study conducted by Benoit et al, it was found that overweight and obesity(56.8%) with (BMI>30) among participants were significantly associated

with poor glycemic control (p value=0.003).^[18] In another study conducted by Banerjee et al^[15] it was found that 59.4% overweight participants and 68.8% obese participants had poor glycemic control. The difference found to be statistically significant (p=0.002).^[15]

In the present study participants having positive history of smoking (67.3%) had poor control of diabetic condition. This difference was found to be statistically significant (p<0.001). In the study conducted by Oluma et al, it was found that 76.1% smoker participants had poor glycemic control.^[19]

In the current study participants having positive history of alcohol intake (70.6%) had poor control of diabetic condition. This difference was found to be statistically significant(p<0.001). In the study conducted by Mideska et al it was found that 75.4% participants with alcoholic history had poor glycemic control. This difference found to be statistically insignificant(p=0.343).^[20]

In this study participants having family history of diabetes (61.9%) had poor control of diabetic condition. This difference was found to be statistically insignificant (p=0.062). In the study conducted by Musenge et al, they found that 65.5% participants who were having family history of diabetes had poor glycemic control.^[21] Meanwhile, in current study there was an insignificant association between family history of diabetes mellitus and poor glycemic control (p value=0.062)

In the current study participant shaving duration of illness 11-15 years and above 15 years had poor control of diabetic condition i.e., (93.6%) and (88.7%) respectively. This difference was found to be statistically significant(p<0.001). In the study conducted by Ufomaet al they found that patients having diabetes duration more than 10 years (60%) were having poor glycemic control.^[22] The difference was found to be statistically significant (p=0.003). In our study patients with poor glycemic control were found to increase with increase in duration of disease. Longer duration of diabetes is known to be associated with poor control, possibly because of progressive impairment of insulin secretion with time because of cell failure, which makes the response to diet alone or oral agents unlikely (UK Prospective Diabetes Study (UKPDS).^[23]

In the present study participants taking either insulin (89.5%) or both oral and insulin (96.6%) as a treatment therapy had poor control of diabetic condition. This difference was found to be statistically significant(p<0.001). In the study conducted by Azzam et al, they found that 76.1% participants who were taking only insulin and 67.8% taking both oral and insulin as a treatment had poor glycemic control.^[24]This difference was found to be statistically insignificant (p<0.061). This finding is consistent with study conducted by Haghighatpanah M et al in which patients receiving insulin plus Oral hypoglycemic agents were more likely to have poor glycemic control compared to patients who were on only oral diabetes medicationor insulin.^[25]

In the present study, participants taking medicine irregularly had poor control (92.7%) of diabetic condition. This difference was found to be statistically significant(p<0.05). Similar finding was observed in study conducted by Fseha B et al.^[26]

Conclusion:

Proportion of diabetic patients having poor glycemic control was higher in the present study. As per the findings of the study, factors significantly associated with poor glycemic control were, age group, educational status, BMI, smoking, alcoholic intake, duration of diabetes treatment, regularity/ adherence to treatment.

Recommendation:

To improve glycemic control effort should be made towards reducing modifiable factors including cessation of smoking, maintaining optimum body weight and strictly adhering to prescribed medications. The importance of good glycemic control in diabetic patients should be ensured so that patients can be protected from the complications of diabetes and potentially avoidable glycemic burden.

Declaration:

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Conflict of Interest: Nil

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Competencies of Indian Medical Graduates in delivering Effective Tuberculosis care: A mixed method study among doctors at Chennai, India

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Abstract:

Introduction: In spite of the various advances in the Tuberculosis (TB) management system in our country, we are still struggling to achieve the End TB strategy. Addressing the health provider difficulties in TB care will definitely be potential tool to control TB. **Objective:** To assess the competency, challenges and solutions of Indian medical graduates to provide effective Tuberculosis care. Method: It is a mixed methodological study conducted among the Bachelor of Medicine and Bachelor of Surgery (MBBS) graduates practising in various parts of Chennai, Tamil Nadu, India. The competency of the Indian medical graduates in delivering TB care was assessed using a content validated e-survey questionnaire disseminated through social media affinity groups and free listing; pile sorting and in-depth interview was done in the qualitative part. **Results:**The proportion of participants having good, fair and poor competency in providing effective TB care was 35%,19% and 46%, respectively. Various challenges in attaining good competency were enlisted by the participants through free listing, a smaller number of TB patients in private medical college has attained the highest Smith S value followed by other eleven challenges. Based on the pile sorting and indepth interview various solutions have been suggested, with most of them emphasizing on compulsory TB chest clinic posting followed by others measures. **Conclusion:** The major reason identified in difficulties in delivering TB care was inadequate exposure in managing TB patients, incomplete knowledge on notification, referral and followup system. These lacunae can be overturned by compulsory posting in TB clinics during internship period, provision of required personal protective equipment (PPE) for doctors and patients in TB wards and outpatient department, mandatory teaching on updates of TB management.

Key Words: Competency, Medical graduates, Tuberculosis

Introduction

Global Tuberculosis Report (2018) places India among the lead contributors for Tuberculosis (TB).^[1]To achieve the strategy of End TB by 2025, the expansion of quality care services involving multiple sectors, strengthening of health systems in government settings, involving private sector in case notification and incentivizing the follow-up of TB clients and adopting innovating policies and

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interventions is deemed essential and reflected in the Revised National Tuberculosis Control Program (RNCTP) which is now renamed as National Tuberculosis Elimination Programme (NTEP).^[2] There is advancement even in diagnostic modality for sputum smear negative patients in the form of Cartridge based nucleic acid amplification test(CBNAAT) which can aid in early diagnosis and medication.^[3] In spite of these advances, challenges remain to achieve TB elimination.

Training curriculum of Indian medical graduates (IMG) as per National Medical Commission (NMC) envisages to equip the medical undergraduates with knowledge, attitudes, skill sets and competencies to adequately address the challenges in tackling with TB. Studies found that current teaching curriculum with class-room and bed-side clinical teaching based on a case study or real patient and performing acidfast bacilli staining in practical curriculum is inadequate to equip the medical graduates to perform the roles as expected in the NTEP program.^[4,5] Innovative curriculums such as Program-Based Teaching on TB control have been pilot tested and revealed the potential for such novel inclusions in the teaching curriculum for medical undergraduates.^[6] Addressing the Health provider difficulties in TB care will definitely be potential tool to control TB. Thus, with the above back ground the study was conducted with the objectives to assess the competency level of the medical graduates in delivering tuberculosis care, to identify the perceived challenges in delivering effective tuberculosis care and to derive perceived solutions to address the challenges enlisted in providing effective tuberculosis care.

Method:

This is a mixed methodology study where the quantitative method is observational cross-sectional study and qualitative method includes free listing, pile sorting and in-depth interview. The study population includes qualified MBBS graduated doctors practising in government and private health sector, Chennai, Tamil Nadu, India. Doctors, who generally do not prescribe or provide TB treatment as they work under senior doctors, were excluded from the study. For quantitative methodology, the sample size was 200 which was obtained by using the formula $4pq/d^2$ where, prevalence (p)=85% (q)=15% (d)=6,minimum required sample was arrived at 142.^[5]Considering non-response rate of 20%,the sample size came as 160, however a higher sample size of 200 was considered. For qualitative methodology, face to face and telephonic in depth interviews were conducted. Sample size of 24 was found to be adequate as no new information was obtained after 17th sample information. Ethical approval was obtained from Institutional Ethics Committee before conducting the study.

Snow ball sampling method was used for quantitative method, in which the competency of the Indian medical graduates in delivering TB care was assessed using a content validated e-survey questionnaire disseminated through social media affinity groups like whatsapp, mails; purposive sampling technique among sub-group of the study population to identify the perceived challenges and solutions in providing effective tuberculosis care. The study was conducted for the period of three months from January to March 2020.

Content validated questionnaire, which in addition to socio-demographic variables contained questions and statements on i) Knowledge on National Tuberculosis Elimination Program (NTEP) guidelines for diagnosis and treatment of TB ii) Attitude of the participants towards TB care iii) Practices on TB management iv) Self-rated competencies in provision of comprehensive TB care at primary level such as epidemiology, transmission, pathogenesis, natural history, risk factors, s y m p t o m s, c o infection with H u m a n immunodeficiency virus (HIV), anti-tubercular drug (indication, contraindication and interactions), drug resistance and communication to patients family. The maximum score is calculated to be 40,the participants were classified based on their score obtained as good (>30), fair (20-30) and poor (<20). Data were entered in MS Excel and frequency and percentage were calculated. Chi square test was used to find the significance on association of competency level with undergraduate education sector. Free listing was done to list out perceived challenges in delivering effective TB care and salience was derived

using a salience score (Smith's *S*). Smith's S score is the importance or representativeness of items to individuals or to the group which is measured by word frequency across lists, word rank within lists or by combining both. ^[7] Pile sorting was done to group the challenges interlinked (Cluster analysis done). Indepth interview was conducted to derive solutions in which transcript; coding and inductive analysis was done.

Methodology used in finding competencies of Indian Medical Graduates in delivering effective TB care:



Results:

The study was conducted among 200 Indian medical graduates whose mean age was 30.5 ± 8 years and nearly two-third of them were males and most of them graduated and working in private health institutions. (Table 1)

Nearly half (46%) of the participants had poor competency in delivering TB care followed by 35% of them having good and 19% of them having average competency.(Figure 1)

The Indian medical graduates who have completed their under graduation (UG) in government medical college had better competency in delivering TB care than those from private medical college background and it is found to be statistically significant with the chi square value of 18.9 and p value <0.05 (Table 2)

The major perceived challenge to obtain good competency to provide effective TB care was having less number of TB patients in private medical colleges, having maximum salience value followed by the other enlisted challenges. The perceived challenges in delivering effective TB care are arranged in descending order of Smith's S value. (Table 3)(Figure 2)

Parameters	Frequency (%)
Gender	
Male	134 (67%)
Female	66 (33%)
Age in years (mean ± SD) = 30.5 ± 8 years	
Age groups	
<25 years	10 (5%)
26 – 30 years	84 (42%)
31 – 35 years	69 (34.5%)
36 – 40 years	24 (12%)
>40 years	13 (6.5%)
Workingin	•
Private sector	112 (56%)
Government sector	88 (44%)
Qualified Undergraduate from	
Private institute	120 (60%)
Government institute	80 (40%)
Socio-economic class*	•
Class I	153 (76.5%)
Class II	47 (23.5%)

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Modified BG Prasad classification

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Indian Medical graduates completed their UG in	Competency in delivering TB care		Total (%)	p value* (Significance)	
	Good (%)	Fair (%)	Poor (%)]	
Private Institute	28 (23.33%)	16 (13.33%)	76 (63.34%)	120 (100%)	1.01
Government	44 (55%)	20 (25%)	16 (20%)	80 (100%)	
institute					

Table 2 . Accordiation of (omnotoncy lovel with	. Undorgraduato Educati	on Soctor $(n-200)$
Table 2 : Association of C	ompetency level with	I Undergraduate Educatio	on sector (n-200)

*Chi square test

It was observed that perceived challenges such as less number of TB patients in private medical college, less exposure to TB patient due to less number of posting days in UG period and stigma creates a barrier to involve family members were piled in the same group indicating perceived relationships on these challenges for having competency in delivering effective TB care. In the same manner two other groups were piled. (Figure 2)

The most commonly perceived solution to improve effective TB care was providing compulsory posting in TB clinics and wards, regular training on NTEP updates. With respect to the challenges related to treatment protocols the perceived solutions attributed were to attend sessions on newer updates and get certification. The pile groups and their respective perceived solutions are listed in Table 4.

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Sr.	Perceived Challenges for having Good competency	Frequency	Average	Smith's S Value
No	to deliver effective Tuberculosis care		Rank	
1	Less number of TB patients in	100	3	0.594
	private medical college			
2	Nursing staff take care of referral procedure	75	2	0.563
	to government hence less idea on it			
3	Procedure of TB notification is unclear	50	1	0.5
4	Communication between Private	50	3	0.25
	and Government sector is low			
5	Less exposure to TB patient, due to less	50	4	0.267
	number of posting days in UG period			
6	Patient have low confidence of Government treatment	50	5.5	0.161
7	Cost of medicine in Private health setup is high	50	2	0.422
8	Thrice weekly to Fixed Dose Combination (FDC)	25	7	0.083
	regimen makes it difficult for doctors to follow			
9	Stigma creates a barrier to involve family members	25	9	0.028
10	Daily drug regimen makes patient depressive	25	8	0.056
	to take medicine daily			
11	No updates on changes in DOTS regimen	25	5	0.139
12	Fear on getting TB to the doctors during the	25	2	0.188
	management of patient			

Table 3 : Perceived Challenges in delivering effective Tuberculosis care (n=200)

Figure 2: Pile sorting on Perceived relationship on various challenges for having Good competency in delivering effective TB care (n=200)*



*The numbers mentioned in the figure corresponds to the Sr.No and respective list of challenges mentioned in the Table 3

Sr. No.	Pile group	Perceived Solutions
1	 Less number of TB patients in private medical college Less exposure to TB patient, due to less number of posting days in UG period Stigma creates a barrier to involve family members Fear on getting TB to the doctors during management of patient 	Compulsory TB posting, minimum of 2 weeks in Regional chest clinic or Government Hospitals during the Internship period Consistent awareness campaign on the fact that TB is a curable disease on effective treatment Provision of masks and other personal protective measures for the doctors
2	 Thrice weekly to FDC regimen makes it difficult for doctors to follow Daily drug regimen makes patient depressive to take medicine daily No updates on changes in DOTS regimen 	Doctors should regularly get equipped with the NTEP updates, webinar should be made available for free and it should be made mandatory for doctors to get certified every time there is a change in treatment guidelines Patient should be educated on the benefits of FDC in aspects of drug adherence and added health benefits
3	 Nursing staff take care of referral procedure to government hence less idea on it Procedure of TB notification is unclear Communication between Private and Government sector is low Patient have low confidence of Government treatment Cost of medicine in Private health setup is high 	Referral procedure should be made by the intern and follow up of the patient has to be submitted at the end of the clinical posting TB notification method has to be explained clearly by organizing a regional CME , especially targeting the Private doctors Cured TB patient should be involved in Community participation to speak about the effectiveness of Government medicine and the health facility

Table 4: Perceived Solutions in overcoming the Challenges in achieving good competency to deliver effective TB care (N=24)

Discussion

Tuberculosis remains a significant public health problem in India and a competent workforce including adequately trained medical care providers remain essential in delivering comprehensive care at primary level.

Current undergraduate MBBS curriculum for tuberculosis is based on NTEP as mandated by National Medical Commission (NMC), however multiple studies cited poor compliance of the guidelines by the physicians and poor awareness among undergraduates to the guidelines mentioned in NTEP which was evident in this study with poor competency in 46% of study participants.^[8-10]Lack of knowledge on the case definitions for tuberculosis and misconceptions about treatment regimens and protocols was reported in a study among medical undergraduates and interns of a government medical college in South India which was in line with the finding in this study where the study participants are medical graduates.^[8] It is observed from this study that there is a knowledge and practice gap with respect to treatment, notification and referral services among the study participants which is comparable to the results of the study among private practitioners in West Bengal.^[10]

Patient-centred model of care defined as "providing care that is respectful of and responsive to, individual patient preferences, needs and values, and ensuring that patient values guide all clinical decisions" is included as part of the End TB strategy.^[11] Provision of patient-centred care in the context of TB incorporates treatment adherence interventions such as patient education and communication in complementing the treatment prescription practices by medical professionals.^[12] This requires reorienting training methodologies to provide communication skills training for patient care for medical undergraduates.Attitude, Ethics and Communication (AETCOM) module implemented by MCI (2015) introduced objective training on those three components. It has to be strengthened and expanded to focus on high burden diseases such as TB.^[13]

Authors assessed the risk-perception of tuberculosis among the study participants which was found to be high among interns. It is well documented that health care providers in India are at an increased risk of TB diseases including drug resistant forms of TB (DR-TB) due to occupational exposure in care settings with poor hospital infection control practices.^[14-18] In a study from a public tertiary setting from India, Pardeshi et al reported that most medical residents perceive tuberculosis as occupational hazard and 51% are fearsome thus avoiding TB patients though feeling compassionate to care for them.^[19] It is to be observed that fear of getting TB during case management was one of the perceived challenge noted in this study which was comparable to the above mentioned studies. Standard operating procedure guidelines for clinical and diagnostic procedures related to clinical care in TB wards, designating intensive care units (ICU), TB laboratories as high risk areas and periodic, repeated trainings of care providers is highly recommended to enable overcome this fear.^[20] One of the important perceived challenge inferred in this study was that stigma creates a barrier to involve family members.

This has to be addressed since it was found reported by Neha Taneja et al that home-based care in MDR TB treatment good scope of improving treatment outcomes of patient.^[21]

Research has been identified as an avenue to improve training exposure on TB disease through qualitative inputs from the study participants. In his editorial, Mohan A highlighted the importance of Operational Research in assessing the NTEP program wherein the medical colleges served the significant role of a research agency in evaluating the strengths and gaps and leading to programmatic reforms related to patient treatment protocols, duration of treatment etc.^[22] Research potential of medical colleges can be enabled by building capacities of the faculties in research conduction with robust and ethics approved pre-registered protocols in timely manner to promote TB related research in medical colleges.^[23]

Conclusion:

The overall competency of the Indian medical graduates in providing effective TB care demands a definitive improvement. The competency level of the medical practitioners who were educated in private medical college was less compared to those trained at government medical college.On reasoning out the difficulties in delivering effective TB care, the major reason identified was inadequate exposure in managing TB patients, incomplete knowledge on notification, referral and followup system. Though the present medical curriculum has appreciable guidelines to equip the medical undergraduates, emphasis on compulsory posting of the medical interns in TB clinic will provide a comprehensive exposure.

Recommendations:

The major recommendation based on the present study findings are compulsory posting in TB clinics during internship period, provision of required personal protective equipment (PPE) for doctors and patients in TB wards and outpatient department, mandatory teaching on updates of TB management, maintenance of log book on TB patient follow-up care by each intern during their respective clinical postings. These measures can definitely contribute to achieve End TB strategy goals.

Limitation of the study:

The study is conducted among doctors in Chennai alone.Includi ng study participants from wide geographic distribution may add up some of valuable inputs to improvise the existing TB care.

Declaration:

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Conflicts of interest: Nil

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Birth Preparedness and Complication Readiness among Pregnant Women in Rural Area of District Sonipat, Haryana, India: A Cross Sectional Community Based Study Anita Punia¹, Muskaan Pruthi², Mehar S Punia³, Anish Punia⁴, Sanjay K Jha¹, Babita Rani¹

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Abstract:

Introduction: Birth Preparedness and Complication Readiness (BPCR) is an important intervention included by WHO as essential elements of antenatal care package. It is often delivered to pregnant women through their active participation by health care provider during antenatal care or initiated/followed up through visits to the homes of pregnant women by community health workers. **Objectives:** To determine the knowledge and practice regarding BPCR and to identify factors associated with it among rural pregnant women. Method: Cross-sectional study was conducted in rural field practice area of Community Medicine Department of a medical teaching institutes. A total of 210 pregnant women who were in the second and third trimesters of pregnancy were selected by simple random sampling and interviewed for data collection. **Results:** Mean age of study subjects was 24.14 <u>+</u> 3.88 years. The highest number of women was in the age group of 20-29 years (84.8%). More than half (57.6%) mothers had observed at least two or more components of BPCR. Maximum number of females had identified facility for delivery (63.8%) followed by transportation (60.9%). Identification of potential blood donor by mothers was low (14.3%). Bleeding was most commonly identified danger symptom in all three phases of child bearing. Knowledge regarding danger signs was significantly associated with birth preparedness. **Conclusion:** In the present study, practice of all components of BPCR by mothers was very low. Bleeding was the most commonly identified danger symptom during all three phases i.e., pregnancy, child birth and after birth.Knowledge regarding other danger signs was highly inadequate.

Key words: Antenatal care, Birth Preparedness, Complication Readiness

Introduction:

Birth preparedness and complication readiness (BPCR) strategically encourages pregnant women, their families and communities to effectively plan for births and deal with emergencies, if they occur. It is a key component of globally accepted safe motherhood programs. The high levels of maternal morbidity and mortality that are prevalent throughout developing world are major concerns especially in rural areas. Globally, more than 40% of pregnant women may experience acute obstetric problems. The WHO estimates that 300 million women in the developing world suffer from short-term or long-term morbidities brought about by pregnancy and childbirth.^[1]The Sustainable Development Goals, set by the United Nations, aimed at reducing global maternal mortality ratio to <70 per 100,000 live

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births by 2030.^[2] Currently, India's maternal mortality ratio is declining from 113 in 2016-18 to 103 per 100000 live births in 2017-19, as per Sample Registration System but still lags behind.^[3]The greater part of maternal deaths as a result of complications occurs during labor, delivery, and within 24 hours of postpartum period.^[4] Reduction in maternal and infant mortality has been an utmost priority of Indian health Services.

Childbirth is one of the greatest events in every woman's life. Safe and healthy pregnancy and childbirth can only lead the mother and the child into a happy and joyous life. Birth preparedness helps in preventing occurrence of the three delays associated with maternal morbidity and mortality.^[5] Most of the causes of maternal mortality are preventable and attributed to three delays: Delay in decision to seek care, delay in reaching the place of care, and delay in receiving appropriate care.^[6] The common danger signs during pregnancy include severe vaginal bleeding, swollen hands/face and blurred vision. Key danger signs during labor and childbirth include severe vaginal bleeding, prolonged labor, convulsions, and retained placenta. Danger signs during postpartum period include loss of consciousness, severe bleeding following childbirth and fever.^[7] Knowledge about these obstetric danger signs during pregnancy, delivery and postpartum is still low in some developing countries.^[8] Maternal morbidly and mortality could be prevented significantly if women and their families recognize obstetric danger signs and promptly seek health care. Inadequate care during this critical time breaks the critical link in the continuum of care, and affects adversely both women and new-borns.^[9]

Women face several constraints in seeking care during pregnancy and child birth. Lack of finances, transportation problems, unwilling husbands and family members whose permission is often required to visit health facility, are some of the major social barriers for accessing care.^[10] BPCR is an intervention included by WHO as an essential element of the antenatal care package.^[11] It is often delivered to pregnant woman by the health care provider during antenatal care or initiated/followed up through visits to the homes of pregnant women by community health workers. The key elements of the birth plan package include recognition of danger signs, plan for a birth attendant, plan for the place of delivery, and saving money for transport or other costs in case the need arises. In addition, for birth preparedness, a potential blood donor and a decision-maker (in case of emergencies) need to be identified.

Knowledge of obstetric danger signs and birth preparedness are strategies aimed at enhancing the utilization of skilled care during low-risk births and emergency obstetric care in complicated cases in low-income countries including India. Despite the fact that BPCR is essential for further improvement of maternal and child health, a little is known about its current magnitude and factors influencing it especially in rural areas.

This study, therefore aimed to fill this gap by assessing the knowledge regarding BPCR among rural pregnant women, through a community based cross sectional study.

Objectives:

- 1. To Assess the knowledge and practices in relation to BPCR among pregnant women in rural area.
- 2. To identify factors associated with the practices of BPCR among study participants.

Method:

A community based cross sectional study was carried from April 2021 to October 2021 in PHC Khanpur and PHC Juan, the rural field practice areas attached to medical college at Sonipat. The two PHCs comprised of seven health sub-centers serving 45216 population as per the latest annual survey 2021 done by the health workers.

Pregnant women who were in the second and third trimesters of pregnancy and willing to participate in the study were the study subjects. The pregnant women who were not mentally healthy or refused to give consent for participation in study and those who could not be contacted even after three visits were excluded from the study. **Sample size and sampling techniques**: Sample size was calculated by assuming the prevalence (p) of BPCR as 50% and taking the absolute error (L) as 7% at 95% level of significance and by using the standard formula for calculation of sample size (N) = $4pq/L^2$ (where q=1-p; the final sample size was 205, rounded of to 210.

Sampling Technique:First of all, total enumeration and enlisting of all pregnant women was done for each of the seven sub-centers of PHCs Khanpur Kalan and Juan. These lists served as sampling frames. From each sampling frame, 30 study subjects were taken randomly. If the selected participant came in exclusion criteria, then women preceding in sampling frame was selected. If that too came in exclusion, then women following the originally selected participant was included for study and so on.

Data collection tools: Before interview, every respondent was explained about the study objectives, procedures and confidentiality of the information obtained from them and then informed consent was obtained. A pretested semi-structured BPCR schedule which was adapted from JHPIEGO (Johns Hopkins Program for International Education in Gynecology and Obstetrics) and prepared in local language was used to interview the women. The schedule included information about sociodemographic characteristics of the respondents, pregnancy characteristics including data on the five basic BPCR practices i.e., questions on having:(i) identified a skilled birth attendant, (ii) identified a health facility in case of emergencies, (iii) identified a potential blood donor, (iv) arranged for transport, and (v) saved money for emergencies and also the questions on the knowledge of maternal danger signs during pregnancy, delivery and after delivery.

Operational definitions:

Birth preparedness and complication readiness: A woman was considered to be prepared for birth preparedness and complications readiness if she had identified at least two of the components of the BPCR items. Knowledgeable on key danger signs: Pregnant women who spontaneously mentioned at least two danger signs out of nine danger signs as identified during pregnancy, at least two out of seven danger signs during labor and child birth, and at least two out of nine danger signs in post-partum period were considered as some knowledgeable for the respective category. And those who didn't mention even two danger signs for each phase were considered as not knowledgeable.

Data management and analysis: Using R statistical software, the analysis was done. The descriptive statistics was computed and the results were described in terms of mean and standard deviation for continuous/quantitative variables and in the form of frequency and proportion for categorical variables. Pearson's chi square test was applied to find the association. P value <0.05 was considered statistically significant.

Ethical consideration: Ethical approval for the study was obtained from the Institutional Ethics Committee.

Results:

Socio-demographic related characteristics:

A total of 210 women were interviewed for data collection. The highest number of women was in the age group of 20-29 years (84.8%) followed by 30-29 years (8.1%) and <20 years (6.7%). Mean age of study subjects was 24.14 + 3.88 years. More than four fifth (83.8%) women were literate up to secondary or above level. But still 10.5% women were illiterate. The monthly income of about 30% families of women was below five thousand. Most of the women were housewives (92.9%).

Reproductive health related characteristics:

More than half of the mothers (52.9%) were already having one child followed by women who were not having their first child (29.5%). More than half (54.2%) of the mothers were in second trimester and the rest in third trimester. More than three fourths of respondents in third trimester of pregnancy had taken four or more ANC check-ups and remaining respondents also had taken two or
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three ANC check-ups. Most of mothers experienced no serious health problem in the past (88.1%). Only 11.9% females had experienced serious health problem in the past like prolonged labour, high fever, retained placenta, tear etc.

BPCR related factors:

Most of mothers (87.6%) were not aware about BPCR while 12.4% had some knowledge about it. Among those who knew, half of the mothers (50%) were informed by Anganwadi worker followed by hospital staff (26.9%) and Accredited Social Health Activist (23.1%).

Regarding practice of BPCR:

Even in the absence of awareness about BPCR package technically, the components covered under BPCR are still being practised. Approximately two third (67.6%) mothers had made some plans for child birth. Almost same number of mothers had identified facility for delivery (63.8%) followed by transportation (60.9%), saved money (30.8%), a skilled provider (15.7%) and a blood donor (14.3%). Only 5.2 % mothers had done all the arrangements. More than half (57.6%) mothers had done at least two arrangements for the birth of child. (Figure 1) Almost all mothers mentioned the public hospitals (97.6%) as a place to give birth to their babies,

whereas some mothers wanted to deliver at home (1.9%) and only 0.5% mothers wanted to give birth in private hospital. More than two third of the mothers (69.5%) used ambulance as the source of transportation followed by private car (18.1%), whereas 3.3% females preferred to go via bus.

Knowledge regarding danger signs:

During pregnancy: Maximum participants knew about bleeding (68.1%) as serious health problem followed by severe abdominal pain (31%), swollen hands and feet (22.9%), loss of consciousness (20.5%), difficulty in breathing (17.6%), high grade fever (13.2%) and headache (7.6%). But 12.9% of women were not aware of any of the danger health problems that can occur during pregnancy. Total 133(63.3%) respondents mentioned at least two danger health problems. (Table 1)

During labor: Above two-third mothers knew about bleeding (68.6%) as serious health problem during labor, followed by delayed labor>12 hours (36.2%), high fever (17.1%) severe head ache (12.4%) and not delivering placenta within 30 minutes (11.4%) and loss of consciousness (6.7%). Somehow, a sizable number of mothers (17.6%) were not aware of any of health problems during labor. About three fifth (59.0%) respondents knew at least two danger problems. (Table2)



Figure 1 : Components of birth preparedness and complication readiness practiced by pregnant women*

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DangerSigns	Primigravida* (n=62)	Multigravida* (n=148)	Total*
Bleeding per vagina	36 (58.1)	107 (72.3)	143 (68.1)
Severe abdominal pain	22 (35.5)	43 (29.1)	65 (31.0)
Swollen hands and feet	17 (27.4)	31 (21.0)	48 (22.9)
Loss of consciousness	10 (16.1)	33 (22.3)	43 (20.5)
Difficult breathing	10 (16.1)	27 (18.2)	37 (17.6)
High grade fever	7 (11.3)	21 (14.2)	28 (13.2)
Blurred vision	2 (3.2)	15 (10.1)	17 (8.1)
Severe headache	5 (8.1)	11 (7.4)	16 (7.6)
At least knew two	36 (58.1)	97 (65.5)	133 (63.3)
Do not know any of the above	15 (24.2)	12 (8.1)	27 (12.9)

Table 1 : Knowledge Regarding Danger Signs during Pregnancy among Pregnant Women (N=210)

Note: Figures in parentheses are percentages *M

*Multiple Responses

Table 2 : Knowledge Regarding Danger Signs during Labor among Pregnant Women (N=210)

Danger signs	Primigravida* (n=62)	Multigravida* (n=148)	Total*
Bleeding per vagina	37 (59.6)	107 (72.2)	144 (68.6)
Placenta not delivered within 30 minutes	10 (16.1)	14 (9.4)	24 (11.4)
Labour lasting more than 12 hours	20 (32.2)	56 (37.8)	76 (36.2)
Loss of consciousness	2 (3.2)	12 (8.1)	14 (6.7)
Severe headache	6 (9.6)	20 (13.5)	26 (12.4)
High grade fever	9 (14.5)	27 (18.2)	36 (17.1)
At least knew two	30 (48.3)	94 (63.5)	124 (59.0)
Do not know any of the above	21 (33.8)	16 (10.8)	37 (17.6)

Note: Figures in parentheses are percentages

After delivery: About three fifth of mothers knew about bleeding as a serious health problem after delivery (59.5%), followed by loss of consciousness (21.4%), swollen hands and feet (20%), difficulty in breathing (16.2%), malodorous vaginal discharge (10.5%), high grade fever (8.6%) and blurred vision (8.1%). Some females (17.6%) did not know about any of health problems that can occur after delivery. One hundred seventeen (57.7%) mothers mentioned at least two serious health problems after delivery. (Table 3) Multigravida are more aware than

*Multiple Responses

primigravida about danger signs in all the three phases of child bearing.

Factors associated with BPCR: Maximum birth preparedness was present in extreme of ages i.e., more than 30 years (88.9%) and less than 20 years (71.4%) as compared to 20-29 years (53.4%). (P value = 0.008). The level of education of a woman is expected to influence her behaviour on issues of health matters. Birth preparedness was slightly more in secondary / Matriculate (58.8%), higher sec. (60.7%) and graduate (57.7%) as compared to illiterate (50%) and primary (50%) but it was not

Danger signs	Primigravida* (n=62)	Multigravida* (n=148)	Total*
Bleeding per vagina	28 (45.2)	97 (65.5)	125 (59.5)
Severe abdominal pain	14 (22.6)	13 (8.8)	27 (12.9)
Swollen hands and feet	8 (12.9)	34 (23.0)	42 (20.0)
Blurred vision	3 (4.8)	14 (9.5)	17 (8.1)
High grade fever	2 (3.2)	16 (10.8)	18 (8.6)
Difficult breathing	9 (14.5)	25 (16.9)	34 (16.2)
Loss of consciousness	19 (30.6)	26 (17.6)	45 (21.4)
Severe headache	2 (3.2)	9 (6.8)	11 (5.2)
Vaginal discharge	6 (9.7)	16 (10.8)	22 (10.5)
At least knew two	30 (48.4)	87 (58.8)	117 (55.7)
Do not know any of the above	21 (33.9)	16 (10.8)	37 (17.6)

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Note: Figures in parentheses are percentages

found statistically significant. Literacy, income, parity, and occupation were not associated significantly with BPCR. Birth preparedness was significantly more among those having at least some knowledge about serious health problems that can occur during pregnancy, labour and after delivery (p <0.05). (Table 4)

Discussion:

BPCR matrix has been identified as the single most important intervention and global benchmark indicator to monitor progress towards the goal of maternal and neonatal morbidity and mortality rates reduction particularly in the developing world settings. The findings of the study revealed that 57.6% females had observed at least two or more components of BPCR. The observed BPCR practice in the study area was lower than study done by Akshaya KM.^[12] and it wasslightly higher than some of other Indian studies conducted in Madhya Pradesh (47.8%, n = 312)^[13] Delhi (41%, n = 417)^[14] and West Bengal (49.4%, n = 240 and 34.5%, n = 355).^[15,16] The reason for this may be difference in criteria for knowledge of BPCR practices in the above mentioned studies or subjects were merely rural-dwelling women where people are presumed to have less information and more problems of accessibility to

*Multiple Responses

health services. Another possible reason may be due to the different population charactersthat might resulted in observed differences.

Highest number of pregnant women was in the age group of 20-29 years (84.8%) followed by 30-29 years (8.1%). Mean age of study subjects was 24.14 + 3.88. Almost similar findingswere observed in a study done by Akshaya KM in Karnataka,India,^[12]The observation clearly reveals that most of the women bear children during the age of 20-29 years.Maximum birth preparedness was present in extreme of ages i.e.,>30 years and <20 years as compared to 20-29 years. The reason for this could be that younger women (<20years) face higher risks of low birth weight, preterm delivery and severe neonatal conditions. Therefore, they need to prepare much more, whereas older women, if they have had an obstetrics issue in the past, ensure not to happen in current pregnancy. The women who were employed in the government and non-government organization were more prepared for birth and its complication as compared to house wives and involved in agriculture but was not significantly associated. These findings are consistent with the study done by Gudeta TA.^[17] The reasons could be, that working women are more educated. Education helps in the understanding of obstetric

Table 4 : C	haracteristic of Parti	cipants and their Ass	ociation with Birth Pr	eparedno	ess
Characteristics*		Birth Preparedness	Birth Preparedness	Total	P value
		Present	Not Present		
		(n=121) n%	(n=89) n%		
Age (years)	<20yrs	10 (71.4)	4 (28.6)	14	0.008
	20-29yrs	95 (53.4)	83 (46.6)	178	#
	>30yrs	16 (88.9)	2 (11.1)	18	1
Parity	Nil	29 (46.8)	33 (53.2)	62	0.101
	One	71 (64.0)	40 (36.0)	111	1
	Two	15 (51.7)	14 (48.3)	29	1
	Three or more	6 (75.0)	2 (25.0)	8	1
Income (Rs.)	<5000	36 (57.1)	27 (42.9)	63	0.087
	5000-10000	13 (43.3)	17 (56.7)	30	1
	10001-15000	20 (58.8)	14 (41.2)	34	1
	15001-20000	12 (48.0)	13 (52.0)	25	1
	20001-25000	10 (52.6)	9 (47.4)	19	1
	>25000	30 (76.9)	9 (23.1)	39	1
Literacy	Illiterate	11 (50.0)	11 (50.0)	22	0.899
5	Primary	6 (50.0)	6 (50.0)	12	1
	Secondary	40 (58.8)	28 (41.2)	68	1
	Higher Sec.	34 (60.7)	22 (39.3)	56	1
	Graduate and above	30 (57.7))	22 (42.3)	52	1
Family type	Nuclear	44 (38.5)	70 (61.5)	114	0.01
5 51	Joint	54 (56.2)	42 (43.8)	96	- #
Family size	1-2	49 (50.0)	4 (50.0)	8	0.806
5	3-5	69 (56.6)	53 (43.4)	122	1
	5or more	48 (60.0)	32 (40.0)	80	1
Occupation	House wife	111 (56.9)	84 (43.1)	195	0.432
I	Iob	7 (77.8)	2 (22.2)	9	1
	Agriculture	3 (50.0)	3 (50.0)	6	1
Obstetric Variables					
Period of gestation	Second trimester	65 (57.0)	49 (43.0)	114	0.848
0	Third trimester	56 (58.3)	40 (41.7)	96	1
Gravida	First gravida	38 (61.3)	24 (38.7)	62	0.001
	Second or more	51 (43.4)	97 (65.6)	148	1
Antenatal check-ups	< 3	51 (61.4)	32 (38.6)	83	0.364
	3 or more	70 (55.1)	57 (44.9)	127	-
Problems related to	Yes	11 (44.0)	14 (56.0)	25	0.142
danger signs in past	No	110 (59.5)	75 (40.5)	185	1
Knowledge of at lea	st 2 danger signs du	ring			
Pregnancy	Yes	88 (62.2)	45 (33.8)	133	0.011
Labor	Yes	84 (67.7)	40 (32.3)	124	0.001
After deliverv	Yes	81 (69.2)	36 (30.8)	117	0.001
*Row wise percentag	es are given #Statis	tically Significant			

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complications and more chances of seeking health information. Moreover, working women get more opportunities to share their problems with colleagues as compared to housewives.

About two-third mothers had identified facility for delivery (63.8%) followed by transportation (60.9%) in present study which is slightly lower than the findings of 71.7% observed by Akshaya KM. ^[12]Money saved for child birth by 30.8% women in this study was less than the findings in West Bengal study (40.8%) and 52.2% in Karnataka study.^[15,12] Identification of potential blood donor by the study participants was low (14.3%). Probable reasons for this might include fear of blood transfusion among rural community. This is comparable to findings of 15.8% in study done in Karnataka, and other studies.^[12,16,18] This component of BPCR is very vital in context of preventing deaths due to PPH etc. when there is urgent need of blood. Hence it is a matter of great concern. Preparedness of the women to identify accompanying person was also not satisfactory (15.7%). This finding of the study is much less than the study finding from Tanzania (86.2%) and some studies in India (69.6%). ^[19,13]The probable reason might be variation in the definition of knowledgeable and the methodology variation or socio-demographic variation due to the local context. In this study only5.2 % females had practiced all the component of birth preparedness.

In present study about two third (68.1%) of the study subjects mentioned vaginal bleeding as danger sign during pregnancy, 68.6% during child birth and 59.5% after child birth.Bleeding is a most commonly identified danger symptom in all three phases. Similar findings were also observed in some other studies.^[18,14]Knowledge regarding other danger signs was highly inadequate in this study. One hundred thirty-three (63.3%) respondents mentioned at least two danger health problems that can occur during pregnancy, 59% during labor and 55.7% after birth. In a study done in Delhi, 27.8% mentioned about one danger sign in all three phases,^[14]where as in Karnataka, 80% of the women were aware of at least

one danger sign.^[12]This difference is primarily due to variation in the definition of knowledgeable in the above studies.

Mothers who were knowledgeable about danger signs during pregnancy, child birth and postpartum also had significantly increased birth preparedness as compared to those who did not know and vice versa. Other studies^[14,20] have also attributed unsatisfactory BPCR practices to poor knowledge of the key danger signs This is also in line with the studies done in southern Ethiopia, Tanzania.^[21,19] Thus, the study highlights the importance of knowledge of danger signs to ensure proper birth preparedness. During ANC visits, service providers should impart quality health education to mothers and family members regarding all the danger signs during pregnancy, intrapartum and postpartum to ensure the practice of BPCR and eventually reduction in maternal and newborn mortality and morbidity.

Conclusion:

More than half women (57.6%) mothers had observed at least two or more components of birth preparedness out of five. Maximum number of mothers had identified facility for delivery followed by transportation. Money saved for child birth and identification of potential blood donor by the study participants was very low in this study. All the components of birth preparedness were practiced only by 5.2% women.Bleeding per vagina is the most commonly identified danger symptom during pregnancy, child birth and after birth.Knowledge regarding other danger signs was highly inadequate in this study. Knowledge regarding danger signs is significantly associated with birth preparedness.

Recommendations:

It is proposed that during ANC visits, service providers should impart quality health education to mothers and family members regarding all the danger signs during pregnancy, intrapartum and postpartum. It is further emphasized that health workers should ensure that mothers and family members have understood properly the importance of practicingall components of BPCR. Thus, the focus shouldnow shift to the quality of ANC services in addition to quantity of health services.

Strengths/Limitations of the Study:

The main strength of current study was that it was a community-based study and used BPCR questionnaire, which was adapted from JHPIEGO. Thus, the study represented the true picture of the facts/situation in the community. Limitations included that the definitions of "adequate knowledge" and "complication readiness/birthpreparedness" as used to express assessment of knowledge of danger signs in pregnancy and BPCR practices are flexible because of lack of uniform standards. Secondly, the income was considered in general instead of appropriate socio-economic classification.

Declaration:

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Conflict of Interest: Nil

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Prevalence and Factors Associated With Depression among School Going Adolescents in Bengaluru: A Cross-Sectional Study

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Abstract:

Introduction: The period of adolescence involves a lot of emotional changes as it is a period of transition to adulthood demanding independence. Adolescents with depression are more likely to have anxiety, disruptive behavior disorder and substance abuse when compared to those who are not depressed.

Objective: To estimate the prevalence of depression among school going adolescents and to assess the factors associated with depression among them. Method: A cross-sectional study was conducted among school going adolescents aged 13-16 years in the urban field practice area of a Medical College. Depression was assessed using Beck's depression inventory (BDI). Total 896 adolescents were included in this study. Single stage cluster sampling method was done in which schools were considered as clusters and students constituted the sampling units. Schools were selected by simple random sampling technique using lottery method. Results: In this study about 45.2% of the adolescents had depressive disorder, out of which mild depression was reported among 22.2% students, 12.4% moderately depressed and 10.6% severe depression. Factors like mother's education, lack of communication by father and mother with their children, lack of needs satisfied by the fathers of the adolescents (61.9%), father's role in adolescents' life (62%) and domestic violence in family (69.7%) were some of the important reasons for developing depression among adolescents. Adolescent whose parents were having conflict (69.2%) were found be depressed when compared to those adolescents whose parents had no conflicts this difference was statistically significant (p<0.05). **Conclusion:** The prevalence of depression was found to be 45.2%. Finding of the study emphasizes the need for creating awareness about the early identification of behavioral changes leading to depression among adolescents by the parents and teachers. It is also important to emphasize to the parents on how their relationship and behavior towards the family affects the mental wellbeing of the adolescents.

Key Words : Adolescents, Beck's Depression Inventory (BDI), Depression, Urban area.

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Introduction:

According to World Health Organization (WHO) adolescent age group ranges between 10 to 19 years.^[1] Adolescence being a transitional period is a stage of emotional instability resulting from demand for separation and independence.^[2] India accounts for nearly 18% of the world's adolescents.^[3]

"Health for the world's adolescents" report by WHO shows that depression is the major cause of sickness and impairment for both the genders in the age group of 10 to 19 years.^[4] Globally, the prevalence of depression in adolescence is 15% to 20%. Most of the mental disorders begin before the age of 14 and 70% by the age of 24.^[5]

The depression rates are similar in both the gender before puberty while females show higher rates during and after adolescence. ^[6] Adolescents with depression are more likely to have anxiety, disruptive behavior disorder and substance misuse when compared to those who are not depressed.^[4]

The various risk factors for depression include childhood abuse, domestic violence/bullying at school, poverty, social exclusion and educational disadvantage. Psychiatric disturbances among parents, marital violence, social and psychological distress also increase the risk.^[6]

Cost-effective interventions have a positive outcome in the management of depression. ^[5] Although depression is preventable and treatable, the stigma and treatment gap associated with depression in India is huge and should be overcome.

Depression being a major risk factor for suicide, significantly affects adolescence but mental health and well-being is overlooked. Early identification of risk factors and routine screening helps in detecting and diagnosing depression at the earliest.

In India, Adolescent Depression is an underresearched area and hence this study was undertaken to estimate the prevalence of depression among school going adolescents aged 13-16 years in Urban field practice area in Bengaluru and to determine the factors associated with depression among the study population.

Method:

A cross sectional study is conducted at an urban field practice area of a medical college in Bengaluru. Adolescents aged 13-16 years studying in high schools during the study period (March 2018- April 2019) were included. Authors excluded adolescents who were absent during the period of data collection and those who have already been diagnosed with depression and on treatment as confirmed by the respective class teachers and health record of the student.

Sample size was calculated using the formula $n=Z^{2*}p(1-p)/e^{2}$. The prevalence (p)of Depression among school going adolescents was considered as 29.9% as per a study conducted by Arun Vashisht et al.^[7]

Z value at 95% Confidence interval = 1.96, P = expected prevalence rate (29.9%),q = 100-p, e = allowable error (15% of p) = 4.48. n = $4 \times 29.9 \times (100 - 29.9) / (4.48)^2$, n = 402.Since it is a cluster sampling method, design effect^[8] was taken into consideration.(n=402*2=804). At a non-response rate of 10%, sample size was estimated and approximated to be 896.

Clearance from Institutional Ethical committee (IEC) and Permission from the school authorities and parents/guardians was obtained before the start of the study. The purpose of the study and the nature of information to be furnished by adolescents were explained to them. Single stage cluster sampling method^[9] was used. In the study area, there were 21 high schools. Each school was considered as a cluster. Five clusters were selected using lottery method under simple random sampling technique. From the selected schools, a line listing of adolescents aged 13-16 years satisfying the inclusion criteria was made.

All the study subjects from the selected schools were interviewed by a pre-tested semi structured self-administered questionnaire in English language. Questionnaire was peer reviewed and validated by experts from psychiatry department. The questionnaire included the demographic details like age, gender, marital status of parents, family income, socio-economic status using modified Kuppuswamy classification, educational qualification of parents and other factors associated with depression. Beck Depression Inventory (BDI)^[10] was included in the questionnaire, Score of 0-9 was graded as no depression, 10-19 as mild, 20-29 as moderate and \geq 30 as severe depression. Health education was given to all the students who were found to be depressed.

The data was entered using Microsoft excel 2010 and analysed using the Statistical Package for Social Sciences (SPSS, Chicago USA), Version 20. Descriptive statistics like percentages and frequencies were applied for categorical data. Chi-square with Fissher exact test was applied to find out the association between two or more attributes. A p-value of <0.05 was considered to be the criteria for statistical significance. Univariate and multivariate logistic regression was done. Odds ratio and confidence intervals were computed.

Results:

In this study out of 896 adolescents, majority were 14 years old, Hindus made up 93.1% of the sample, Of the total population, majority 54.2% were male. About 80.5% of people belong to nuclear families, while 19.5% belong to joint families. A total of 354 adolescents (39.5%) were studying 8th

Socio-Demograph	Frequency (%)	
Age (Years)	13	256 (28.6)
	14	312 (34.8)
	15	244 (27.2)
	16	84 (9.4)
Religion	Hindu	834 (93.1)
	Muslim	37 (4.1)
	Christian	25 (2.8)
Gender	Male	486 (54.2)
	Female	410 (45.8)
Type of Family	Nuclear	721 (80.5)
	Joint	175 (19.5)
Educational Status	Eighth	354 (39.5)
(Standard)	Ninth	276 (30.8)
	Tenth	266 (29.7)
Marital Status	Married & living together	847 (94.6)
of parents	Divorced	9 (1)
	Separated	2 (0.2)
	Widow/ Widower	38 (4.2)
Socio-Economic Status	Class I	232 (25.9)
(Modified Kuppuswamy scale)	Class II	213 (23.8)
	Class III	289 (32.3)
	Class IV	162 (18.0)

Table 1 : Socio-Demographic Characteristics of Study Population (N=896)

standard, followed by 276 (30.8%) were studying 9th standard. In this study, majority 847 (94.6%) adolescents live with their parents who are currently married and living together. According to the modified Kuppuswamy scale of socio economic status, majority 289 (32.3%) belongs to class III (Table 1)

In this study majority of the study subjects, 584 (65.2%) had no difficulty in approaching the teacher and 547 (61%) said that the rules were not strict in school. Majority 649 (72.4%) were able to follow the curriculum and 710 (79.2%) of the study subjects, were not getting bullied at school. According to the Beck Depression Inventory (BDI), prevalence of depression in the study population was 45.2%.

Based on socio demographic factors, the prevalence of depression was found to be high among nuclear families compared to joint families (p<0.05). Moreover, the prevalence was found to be high among mothers who had an education below 12th standard. (Table 2)

When asked about depression in adolescents and their relationship with their fathers, 43 adolescents reported that they did not have adequate communication with their fathers, of which 29 (67.3%) were depressed. Among the 63 adolescents who believed that their fathers did not meet their needs, 39 (61.9%) were identified as depressed. Among the 108 adolescents who believed that their fathers played no role in decision-making, 67 (62%) were identified as depressed.

Depression was observed to be more among those adolescents who experienced partiality towards sibling by their parents (OR=1.68; P=<0.0001),Being bullied at school (OR=2.41; P=<0.0001), No Friends to share problems with (OR=2.11; P=<0.0001), Feel like running away from home (OR=3.7, P=0.0001), Feel like this life is not worth enough to live (OR=2.8, P=<0.0001), Feel lonely (OR=3.9, P=<0.0001) (Table 3)

Discussion:

In the present study, out of the 896 adolescents, majority of them were males (54.2%) and 45.8% were females and these findings were consistent with the study done by Rani Mohanraj et al.^[11] where 53% were boys and 47% were girls. In this study 34.8% were in the age group of 14 years followed by almost equal distribution of adolescents aged 13 (28.6%) and the least belonged to age group of 16 years (9.4%). The mean age group was 15.5 ± 0.6 years which is in exact consistency with the study by Surabhi Chauhan et al.^[12] where mean age was $15.5 \pm$ 0.6 years.

The prevalence of depression in this study was found to be 45.2% of which 22.2% had mild depression, 12.4% had moderate depression and 10.6% were severely depressed mostly because of disturbed childhood. The prevalence rates differ between various studies due to difference in the age group, data collection tools used, and varied diagnostic criteria. Many studies have observed females to be significantly more depressed than males.^[12-15] In the present study although there was no statistical significance, depression was more among female students (45.4%) due to various factors like inability to cope with stress, male dominance and partiality towards them when compared to their male sibling.

In this study, there was no association of age with depression, however the prevalence was higher among those aged 15-16 years (45.4%). This difference in age may be due to fact that adolescents will have better capacity to handle the stress as they grow older. Adolescents from nuclear families (66.3%) were found to be more depressed than those who belonged to joint families (40.1%) may be because of lack of sufficient attention from parents or due to the loss(death/ divorce/ separate) of one parent, lack of love and affection from other kith and kin within the family.

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Variable	Category	Depre	ession	Total n (%)	Chi-square	p value
		accord	ling to BDI		-	-
		(N=	896)			
		Present	Absent			
		(N=405)	(N=491)			
		n (%)	n (%)			
Age (in years)	≤14 years	256 (45.1)	312 (54.9)	568 (100)	0.011	0.918
	≥ 15 years	149 (45.4)	179 (54.6)	328 (100)		
Gender	Male	206 (42.4)	280 (57.6)	486 (100)	3.39	0.06
	Female	199 (48.5)	211 (51.5)	410 (100)		
Religion	Hindu	377 (45.2)	457 (54.8)	834 (100)	0.45	0.7
	Muslim	18 (48.6)	19 (51.4)	37 (100)		
	Christian	10 (40)	15 (60)	25 (100)		
Type of family	Nuclear	289 (40.1)	432 (59.9)	721 (100)	39.03	< 0.001*
	Joint	59 (33.7)	116 (66.3)	175 (100)		
Educational	Eighth	166 (46.9)	188 (53.1)	354 (100)	0.67	0.7
status of study	Ninth	122 (44.2)	154 (55.8)	276 (100)		
subjects	Tenth	117 (44)	149 (56)	266 (100)		
Marital	Married &	380 (44.9)	467 (55.1)	847 (100)	0.59	0.7
status of parents	living together					
	Divorced	6 (54.5)	5 (45.5)	11 (100)	-	
	Widow/ Widower	19 (50%)	19 (50%)	38 (100)		
Father's education	≤12 th standard	284 (46.5)	327 (53.5)	611 (100)	1.175	0.278
	>12 th standard	122 (42.8)	163 (57.2)	285 (100)		
Mother's education	≤12 th standard	322 (47.4)	357 (52.6)	679 (100)	5.58	< 0.001*
	>12 th standard	83 (38.2)	134 (61.8)	217 (100)		
Socio-Economic	Class I & II	190 (42.7)	255 (57.3)	445 (100)	2.23	0.135
Status (modified	Class III & IV	215 (47.7)	236 (52.3)	451 (100)		
Kuppuswamy scale)						
Siblings	Present	347 (44.2)	438 (55.8)	785 (100)	1.9	0.1
	Absent	58 (52.3)	53 (47.7)	111 (100)		

Table 2 : Association of Socio-Demographic Factors with Depression among study participants

*Statistically significant

Married parents who are living together is known to be a positive factor against adolescent depression. Presence or absence of siblings was not significantly associated with depression in this study. This may be attributed to the fact that as they grow older, they identify themselves as an individual for decision making towards dating and other risk seeking behavior and hence often do not depend on their siblings for emotional support due to the fear of disclosing to their parents.

This study showed that mother's educational status has been cited as an influencing factor on

Variable	Adjusted Odds Ratio (95% CI)	p value
Parents partial towards sibling	1.68 (1.16-2.43)	< 0.001
Being bullied at school	2.41 (1.66-3.49)	< 0.001
Absence of friends to share problems with	2.11 (1.40-3.19)	<0.001
Feel like running away from home	3.7 (1.91-7.13)	< 0.001
Feel like this life is not worth enough to live	2.8 (1.83-4.55)	<0.001
(suicidal ideation)		
Feel lonely	3.9 (2.83-5.47)	< 0.001

Table 3 : Results of Multivariate Logistic Regression Analysis (N=896)

children as educated mothers are said to be better off in handling day to day stressful events and also provide better emotional support to their children at homes. These findings highlight the importance of role of family in development of adolescent depression. Conflict between parents was also found to be significantly associated with depression, which hampers the child's mental pursuit.

Several studies have shown that being bullied at school was significantly associated with depression^[16-17] and these findings are consistent with the present study, whereas bullying was not associated with depression in a study by Man Mohan Singh et al.^[18] Above findings suggest that there is a need for mental counseling of children to help them cope up with studies and to mitigate other factors responsible for depression.

In the present study, factors which triggered suicidal ideation like thoughts about running away from home, loneliness and feeling like 'this life is not worth living' were significantly associated with depression.

Conclusion:

In this study, the prevalence of depression was found to be 45.2% of which 22.2% had mild depression, 12.4% had moderate depression and 10.6% were severely depressed.

Factors like family type, parents' communication, conflict between parents, domestic violence in family, partiality towards sibling by parents, father's role in life and needs satisfied by father, being bullied at school, feeling lonely, feeling like escaping from home and suicidal ideation were found to be significantly associated with depression.

Recommendations:

Study emphasizes the need for creating awareness about depression to the community, parents and teachers in order to recognize the symptoms at the earliest for early diagnosis and treatment.

Limitations:

Over reporting or under reporting of data due to self-administered questionnaire. Obtaining additional information from other sources like parents and teachers would have enhanced the validity of the study. Sexual component could not be assessed due to socio-cultural barriers.

Declaration:

Funding: Nil

Conflict of Interest: Nil

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A Case Control Study on Risk Factors and Drug Prescription Patterns in Glaucoma at a tertiary eye care center in a city of Western India

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Abstract:

Introduction: Glaucoma is an idiopathic, progressive optic disc neuropathy complicating into irreversible blindness if untreated. Early diagnosis by screening cases from high-risk populations has a pivotal role in managing this major public health problem with high treatment expenditures. **Objectives:** To identify the various ocular and non ocular risk factors of glaucoma and to identify the drug prescription pattern among glaucoma patients. **Method:** This was an observational, case-control study including 165 adult Glaucoma patients on treatment as cases and 165 age and sex-matched healthy individuals as controls, all of which were randomly selected from the patients visiting a tertiary eye care center. Various risk factors, drug prescription pattern and symptoms of the patients were recorded and analyzed. **Results**: A total of 165 adult Glaucoma patients and age and gender matched 165 controls were enrolled. Majority of the patients (41.21%) complained of blurring of vision at the time of study. The Odds ratios for Family history, Hypertension, Diabetes Mellitus, Migraine, Sleep apnea and Smoking showed strong association as risk factors for Glaucoma and the differences between the two groups were statistically significant (p value < 0.05). The mean number of drugs per prescription \pm SD was 1.88 \pm 0.79. Fixed drug formulations were prescribed in 42.4% patients. All the drugs were prescribed by their brand names and majority of them were in the form of eye drops. **Conclusion**: Primary Open Angle Glaucoma (POAG) was the most common subtype in the study. Age, Family history, Myopia, Hypertension, Diabetes Mellitus, Sleep Apnea, Migraine, Corticosteroid usage and Smoking emerged as putative risk factors. In consistence with present guidelines, Prostaglandin analogs were the most prescribed antiglaucoma drugs. The considerable proportion of asymptomatic cases (23%) suggests the need for periodic eye examinations to detect glaucomatous changes at an early stage.

Keywords: Drug Prescription Patterns, Glaucoma, Intraocular Pressure, Risk Factors

Introduction:

Glaucoma is a multifactorial, idiopathic, progressive optic disc neuropathy leading to irreversible blindness if not treated -aptly entitled the 'silent thief of sight'.^[1, 2] Open Angle Glaucoma is the commonest type (~90%), others including Angle Closure Glaucoma and Normal Tension Glaucoma.

Risk factors for Glaucoma include elevated Intraocular Pressure (IOP>21 mm Hg), a positive family history, Myopia, Hypertension, Diabetes Mellitus etc. Open Angle Glaucoma ensues due to inadequate drainage of aqueous humor through the trabecular meshwork, while in Angle Closure Glaucoma the iris apposes against the trabecular meshwork.^[3]

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Workup includes IOP estimation by Tonometry,^[4] Iridocorneal angle assessment by Gonioscopy and fundus examination for Cup-to-Disc Ratio (CDR) and vascular changes. Glaucoma is the second leading cause of blindness worldwide with around 12 million patients in India.^[5,6] A large proportion of patients come from the elderly age group who generally ignore it as an age-related inevitability.^[7] Early diagnosis and treatment plays a very important role in management.^[7,8]

Various drugs including Prostaglandin (PG) analogs, β -blockers, $\alpha 2$ agonists, Miotics and Carbonic anhydrase inhibitors are used in the treatment of Glaucoma. Depending on the CDR and other parameters, Glaucoma is categorized as mild, moderate and severe and accordingly a target IOP range which prevents further damage is decided.^[9] PG analogs are introduced first in the treatment regimen, due to their long duration of action, good IOP lowering action and once-daily dosing.^[10] In case of poor control with PG analogs, drugs from other classes/drug combinations are added as required.

With rising treatment costs and an aging population, Glaucoma is becoming a major public health problem.^[11] Hence we decided to undertake this study to assess the presence of various ocular and systemic risk factors in Glaucoma patients versus controls and to analyze drug utilization patterns in Glaucoma patients.

Method:

This was an observational, case-control study carried out at a tertiary care eye hospital for a period of 3 months in the year 2019. Total 165 Cases attended the Glaucoma unit during the study duration. Sampling technique used was Purposive. Adult patients suffering from any type of Glaucoma on treatment, willing to give informed consent were enrolled as cases. They underwent a comprehensive ophthalmological examination consisting of Slit lamp examination, Gonioscopy, Non-contact Tonometry (NCT), fundus evaluation, Pachymetry and optic disc photography. In Gonioscopy, anterior chamber was classified according to Schaeffer's grading. ^[12] Grades 3 and 4 were considered as 'Open angle' while angles of Grade 2 and less were considered as 'Occludable'. Demographic details, chief complaints, clinical diagnosis, medical history and drug prescriptions were noted with a detailed focus on the presence of risk factors.

Age and sex-matched healthy adult individuals not having Glaucoma and consenting to participate were enrolled as controls and subjected to detailed history taking and examination. Total 165 control were included in the study.

Variables and risk factors assessed in the study participants were; Ocular measurements [e.g. IOP, Central corneal thickness (CCT), CDR], Family history, Spherical refractive error, Systemic disorders (e.g. Hypertension, Diabetes Mellitus, Hypothyroidism), Sleep apnea, Migraine, Smoking, Use of corticosteroids etc. The prescription pattern was recorded and analyzed in detail including data on dosage form, route of administration, single/combination therapy etc.

Results:

A case control study was conducted among 165 cases (glaucoma) and 165 Controls (without glaucoma) at a tertiary eye care center, after obtaining their informed consent.

Table 1 depicts the age and gender distribution among enrolled cases and controls.

In case of symptomatology, majority of the patients (41.21%) complained of blurring of vision, other complaints being watering (24.8%), redness in the eye (26%) etc. There were 23.03% cases in which the diagnosis was accidental where the patients did not show any symptoms of the disease.

Table 1 : Age and Gender wise Distribution ofStudy Participants

Variables	Cases	Controls				
	(n=165)*(%)	(n=165)*(%)				
Age groups (Age groups (in years)					
(Mean age: 56.31 ± 13.49 years)						
18-20	6 (3.64)	5 (3.03)				
21-30	2 (1.21)	4 (2.42)				
31-40	12 (7.28)	9 (5.46)				
41-50	26(17.76)	28 (16.97)				
51-60	48 (29.09)	48 (29.09)				
61-70	55 (33.33)	55 (33.33)				
>70	16 (9.7)	16 (9.7)				
Gender						
Male	103 (62.42)	100 (60.6)				
Female	62 (37.58)	65 (39.4)				

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Glaucoma being a chronic disease, the history of glaucoma in the patients ranged from being as fresh as less than a year to being as old as 20 years. Majority of the patients (60%) had duration of disease between 1-5 years. Figure 1 shows the distribution of various subtypes of Glaucoma amongst the patients.





PACG- Primary Angle Closure Glaucoma, POAG-Primary Open Angle Glaucoma, Secondary glaucoma due to Vitreous degeneration, Retinal detachment, Corticosteroid usage

Risk factor assessment:

A) OCULAR VARIABLES:

IOP was found to be raised in 53(32.12 %) patients despite treatment. The highest value recorded was 46 mm Hg (Mean- $32 \pm .6$ mm Hg, Normal-10 to 21 mm Hg). CCT was measured by Pachymetry and was found to be low in 134 (81.21%) patients. CDR was also found to be high in 134 (81.21%) of the patients. (Normal value: d" 0.4) CDR asymmetry- difference in CDR of both eyes >0.2 was found to be present in 34 (20.6%) patients. IOP and CDR were normal in all controls.

B) SYSTEMIC RISK FACTORS:

Table 2 shows the analysis of systemic risk factors. The Odds ratios for Smoking, Migraine, Family history, Sleep apnea, Diabetes Mellitus Hypertension and Myopia showed significant association of these as risk factors for Glaucoma and the differences between the two groups were statistically significant.

Systemic Disk Factors CASES CONTROLS Chi-Square nV					
Systemic Risk ractors	(n=165)*(%)	(N=165) *(%)	Odds Ratio (OR)		
Smoking	11	2	χ ² =6.486 (df=1);		
	(6.7%)	(1.21%)	p=0.011; OR=5.82		
Migraine	30	9	χ^2 =12.923 (df=1);		
	(18.2%)	(5.45%)	p=0.0003; OR=3.85		
Family history	40	16	χ^2 =12.830 (df=1);		
	(24.2%)	(9.69%)	p=0.0004; OR=2.98		
Sleep apnea	52	25	χ^2 =12.388 (df=1);		
	(31.5%)	(15.15%)	p=0.0004; OR=2.58		
Diabetes Mellitus	41	21	χ^2 =7.994 (df=1);		
	(24.8%)	(12.73%)	p=0.0048; OR=2.267		
Hypertension	56	32	χ^2 =9.75 (df=1);		
	(33.9%)	(19.39%)	p=0.0046; OR=2.032		
Муоріа	113	93	χ^2 =5.167 (df=1);		
	(68.5%)	(56.36%)	p=0.023; OR=1.682		
Use of corticosteroids	8	2	p=0.1041 (by Fisher's		
	(4.85%)	(1.21%)	exacttest); OR=2.75		
Hypothyroidism	4	11	χ^2 =3.422 (df=1);		
	(2.43%)	(6.67%)	p=0.064; OR=0.35		

 Table 2 : Systemic Risk Factors Among Cases And Controls

*p-value<0.05 was considered as statistically significant

Drug Prescription Pattern:

A total of 292 drug formulations were prescribed to 165 patients. The mean number of drugs per prescription \pm SD was 1.88 \pm 0.79.

Antiglaucoma Drug/FDC	Number of patients prescribed* (%)
Prostaglandin Analogs	131
(Bimatoprost, Travoprost, Latanoprost)	(79.39%)
Brimonidine and Timolol	52
	(31.51%)
Brimonidine	26
	(15.76%)
Brinzolamide	18
	(10.9%)
Dorzolamide	17
	(10.3%)
Timolol	14
	(8.48%)
Brimonidine and	10
Brinzolamide	(6.06%)
Betaxolol	7
	(4.24%)
Travoprost and Timolol	7
	(4.24%)
Dorzolamide and Timolol	4
	(2.42%)
Pilocarpine	2
	(1.21%)
Oral Acetazolamide	1
	(0.61%)
Mannitol I.V.	1
	(0.61%)

Table 3 : Drug Prescription	Pattern of Antiglaucoma	medications among cases	(n=165)
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*Multiple responses

The most common antiglaucoma drug class prescribed was Prostaglandin analogs in 131(79.39%) patients. The most commonly prescribed FDC was Brimonidine + Timolol in 52(31.52%) patients. (Table 3)

While in case of other drugs, the most commonly prescribed drug formulation was Carboxymethyl cellulose in 15(9.09%) patients. Majority of the patients were prescribed dual therapy (47.27%).

Discussion:

In this study, 165 patients and 165 controls enrolled with a male: female ratio of 1.66 and 1.54 respectively. The mean \pm SD for age of patients was 56.31 ± 13.49 years.

These findings are similar to the studies carried out in Maharashtra^[13], Brazil^[14], Karnataka^[15], Gujarat^[16] and Uttar Pradesh^[17] It has been

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documented that incidence of Glaucoma rises with age.^[18] This is because of decreased ganglion cell number as well as their rising vulnerability to IOP related insults.The most common presenting symptom of the patients was blurring of vision (41.21%) - this finding is in consistence with the studies conducted in Maharashtra^[13] and Madhya Pradesh.^[19] However, the proportion of patients with ocular pain and headache was higher compared to the study undertaken in Madhya Pradesh.^[19]

A large portion of Glaucoma remains undiagnosed. In present study also, a significant proportion (23.03%) of patients were asymptomatic and were diagnosed accidentally when they came for a routine eye examination. This suggests that screening will help in exploring the hidden portion of iceberg in this disease.

Majority of the patients (71.52%) were suffering from POAG. These results are similar to those obtained in the studies done at Ahmedabad,^[16] Uttar Pradesh^[17] and Mangalore.^[20] However, in a study done in Madhya Pradesh^[19], PACG emerged as the most common subtype and proportion of secondary glaucoma patients was also higher. In this study, 75.8% patients had Glaucoma for duration greater than a year, which is very high compared to the value obtained in the South Korea study.^[21]

First-degree relatives of patients with POAG have a 10 times greater risk of having the disease.^[22]A study in Lucknow^[23] also showed a strong association of POAG to family history with OR 4.22. In this study, family history emerged as an important risk factor with OR of 2.98 and the difference between the two groups was statistically significant. 24.2% of the patients had a positive family history of glaucoma. This value is lower than that obtained in the study conducted in Brazil^[14] and much higher than those obtained in the studies carried out in Madhya Pradesh^[19] and South Korea.^[21] Majority of the patients had a positive family history of Glaucoma pertaining to siblings.

Myopia is also a significant risk factor for glaucoma.^[24] Similar findings were obtained in this study, with OR =1.68 which was statistically significant. The proportion of myopic glaucoma patients in this study is substantially higher as compared to the studies done in Brazil^[14] and Madhya Pradesh.^[19]

Hypertension emerged as a statistically significant risk factor for Glaucoma with OR of 2.03. 33.9% patients in the study were known cases of hypertension on treatment. This value is much higher than that obtained in the study carried out in Madhya Pradesh.^[19] While the study in Brazil showed even greater proportions of hypertensive glaucoma patients.^[14] Blood pressure is a clinically modifiable risk factor and has a profound potential for new treatment strategies.^[24]

Diabetes Mellitus was also found to be a major risk factor in this study with OR= 2.27 and difference between cases and controls was statistically significant, which is similar to the Lucknow study on POAG.^[23] The higher incidence of glaucoma in diabetics could also be because of the fact that they frequently undergo regular eye examinations for retinal conditions and hence the odds of detection are higher in such patients.^[19]

Glaucoma patients and their close relatives are said to have higher corticosteroid responsiveness and hence it is necessary to educate the patients who are prescribed such drugs, not to continue their administration for periods further than those specified by the prescriber. Similar to the study done in Lucknow^[23], the Odds ratio showed strong association but it was statistically insignificant. This is likely due to the lesser number of patients with steroid-induced glaucoma in this study. Hence, studies with evenly distributed cases are required for a better picture.

It has been found that people with Sleep apnea have 1.67 times more risk of development of glaucoma.^[12] In our study also, in case of Sleep apnea an OR of 2.58 showed a strong positive association

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Risk factors and Drug prescription pattern in Glaucoma...

which was statistically significant. In this study, Smoking was also found to be a major risk factor for Glaucoma with OR 5.82 which was statistically significant. 6.7% of the enrolled patients were found to be smokers, which is similar to the findings of the study done in Madhya Pradesh.^[19]

It has been documented that hypothyroidism may lead to Glaucoma by hyaluronate like substances blocking the trabecular meshwork and levothyroxine therapy normalizes IOP in such patients.^[25,26] Hypothyroidism could not be established as a risk factor in this study, with OR <1 and P-value >0.05. The study carried out at Lucknow also did not find thyroid dysfunction as a significant risk factor.^[23]

The mean number of drugs per prescription \pm SD was 1.88 \pm 0.79 which is lower than the value obtained in the study carried out at Mangalore^[20] and higher than those obtained in the studies of Uttar Pradesh^[17] and Central India.^[27] This is because our study was conducted in a tertiary care eye hospital where many patients already on treatment with uncontrolled disease are referred.

The most common antiglaucoma drug class prescribed was Prostaglandin analogs, which is in consistence with the latest guidelines enlisting them as first line drugs, overshadowing topical β -blockers which might be prescribed due to cost considerations. Brimonidine + Timolol was the most commonly prescribed FDC in this study, similar to the studies carried out in Karnataka^[15], Ahmedabad^[16] and Uttar Pradesh.^[17] However, Timolol was the most prescribed drug as monotherapy in a few other studies.^[15,27] Out of the Prostaglandin analogs, Bimatoprostis prescribed more because of lower cost and single bedtime instillation.^[28] Moreover, Latanoprost requires refrigeration for storage.^[29]

Almost all of the drugs prescribed in this study were in the form of eye drops, which supports the use of topical formulations owing to their site-specific action, lesser systemic absorption and fewer adverse effects. However, all the drugs were prescribed by their brand names. Many clinicians do not rely on the bioavailability of generic drugs-hence it needs to be ensured that generic drugs meet the essential quality standards. This is of paramount importance in Glaucoma as the cost of treatment is pretty high.

Total 42.4% of the patients in this study were prescribed fixed dose formulations. This leads to improved compliance and convenience due to lesser number of instillations as compared to concurrent use of separate medications.^[30]

Conclusion:

Age, Family history, Myopia, Hypertension, Diabetes Mellitus, Sleep Apnea, Migraine, Corticosteroid usage and Smoking emerged as putative risk factors. POAG was the most common diagnosis. In consistence with guidelines, Prostaglandin analogs were the most prescribed antiglaucoma drugs. The considerable proportion of asymptomatic cases suggests the need of periodic eye examinations to detect glaucomatous changes at an early stage.

Limitations of the study:

Compliance to medications prescribed to the patients was not studied. Cost and side effects related data pertaining to drug prescription was not analyzed.

Recommendations:

This study aimed to fill the gaps in data regarding the association of various risk factors and drug prescription patterns in Indian patients suffering from Glaucoma. However, community-based studies with a larger sample size may further aid in bringing out the finer details of the same. Screening of family members of Glaucoma patients above the age of 30 for the presence of other risk factors and their tracking will lead to an earlier diagnosis and will aid in development of preventive strategies. Educating the patients regarding compliance to treatment has a pivotal role in preventing complications like blindness. **Declaration:** DrSanket Bharadwaj, DrKavisha Goswami and DrShahnoor Gowani were interns at the time of conduction of study and they have worked under the guidance of DrReemaRaval and Dr Kintu Shah in the Glucoma Unit of C.H. Nagri Eye Hospital, Ahmedabad.

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Internet Addiction and Its Correlates among College Students of Surat City: A Cross Sectional Study Abhishek Mukherjee¹, Mohua Moitra², Vipul Chaudhari³, Avantika Gupta¹, Geeta Patel¹, J.K. Kosambiya⁴

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Abstract:

Introduction: The number of internet users in 2018 was 4.021 billion, increased 7 percent year-on-year. More than nine-tenths of Indian teens use Internet. Due to social distancing norms put forward due to COVID-19 dependency and availability of Internet usage has increased. **Objective:** To assess the extent of Internet addiction and determine its predictors among college students of Surat city. Method: A cross sectional study was conducted from March-September 2021 among 400 first- and second-year students selected by systematic random sampling from four colleges selected purposively. Outcome variables were Young's Internet addiction Test and Duke Health Profile Score which were assessed in terms of mean score. Univariate analysis was done, followed by t-test, ANOVA and Pearson Correlation to establish associations. Predictors were determined by Binary Logistic Regression. Results: Around one-tenth (12.8%) participants were seen with no Internet addiction, with majority being mild (44.8%) and moderately (36.5%) addicted. Severe addiction was seen in around one out of twenty participants (6.1%). Social networking (32%) and education (34.5%) were the major reasons for use of Internet. Higher pocket money (aOR=4.3), greater monthly internet expenditure (aOR=2.8), ownership of internet enabled mobile phone (aOR=3.9), lying down posture while accessing internet (aOR=4.8) and evening (aOR=2.2) or night time (aOR=8.7) of internet access were significant predictors for Internet addicts. Conclusion: In this study more than four fifth of the college students had Internet Addiction even at young age. Physical, Mental, Social and General health were significantly negatively correlated with internet addiction.

Key words : College students, Duke Health Profile, Young's Internet Addiction,

Introduction:

Internet is a global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication protocols.^[1] A survey of 26 countries conducted by British Broadcasting Corporation in March 2010 found that nearly 4 out of 5 people (79%, to be exact) believe that access to the Internet is a "fundamental human right".^[2] In 2020, India had nearly 700 million internet users across the country. In 2019, India ranked second next to China, for being the largest online market.^[3] 95% of Indian teens were found to be using internet. 70% youth use Internet for >5 hours/week and 52% access social media at school.^[4]

Internet Addiction is any online-related, compulsive behavior which interferes with normal living and causes severe stress on family, friends, loved ones, and one's work environment.^[5]Young linked excessive Internet use most closely to pathological gambling which has been marked as a disorder of impulse control in Diagnostic Statistical Manual (DSM IV). Young then adapted the DSM IV criteria to relate to internet use in the Internet addiction test.^[5]

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Multiple studies over the time have documented internet addiction, where a rise of addiction prevalence was seen as years pass. Study done by Krishnamurthy et al.^[6] documented Internet addiction prevalence as 43% which has risen to 97.8% in study done by Jaiswal et al.^[7] over a period of five years.

COVID-19 pandemic has disrupted normal pattern of daily activities. As of April 2020, approximately 3 billion people worldwide were required to stay at home and colleges had implemented online education as mode of teaching.^[8] Staying physically away from colleges, dependency on technology and internet for daily life, vulnerability of addiction among adolescence would have put the population under observation at risk for mental health affliction like Internet addiction. In India 2nd wave of COVID-19 pandemic continued roughly for a period of March 2021 to October 2021 affecting about 1.7 crore people.^[9] Physical classes were postponed indefinitely and classes were held over online portals. Therefore, it is important to understand how the COVID-19 pandemic has influenced the use of technology during this unique period and whether there is any change in Internet addiction prevalence. Based on the quarantines of the COVID-19 pandemic and stay at home mandates, this study explores the extent of Internet addiction, factors affecting it and psychosocial domains correlated with it.

This study was conducted because data on Internet addiction is sparse in South Gujarat especially at inter-college level. More importantly this study examines the prevalence rate of Internet addiction during COVID-19 pandemic and its psychosocial risk factors among the population under study. The results obtained from this research may provide useful information for parents, schools, colleges and policy makers to promote prevention of Internet addiction by maintaining a proper balance of availability of Internet educational resources and dependency towards them.

Method:

A cross sectional study from March 2021 to September 2021 was conducted among college students of Surat city. Permission was sought from Institutional Scientific Review and Human research Ethics Board. (Ref no. GMCS / STU / ETHICS / Approval / 29832 / 19). Permission was taken from Principals of the respective colleges. Informed written consent of the participants was obtained after explaining the contents of the participant information sheet to them in a language they understand and comprehend. The participants were ensured about maintenance of confidentiality by not taking any identifiers and cumulatively presenting the data.

Sample Size:

Taking a prevalence rate of 38.2% for Internet addiction,^[10] absolute precision at 5% and 95% Confidence level and 80% power, a sample size of 363 was obtained. Applying a 10% rate for nonresponsiveness, the sample size was 399. This was rounded off to a final sample size of 400 for the ease of uniform data collection from the 4 purposively selected colleges.

Sampling:

Out of 31 colleges in Surat city, four were chosen purposively of different streams of Medical, Engineering, Physiotherapy and Humanities. Total number of students in first and second year for the four colleges were similar in strength according to the data provided by school principals. Thus, according to probability proportionate to size, 100 eligible participants were selected from each college. Systemic random sampling was done after calculating sampling interval for each college till the sample size was reached. First and second year students more or equal to eighteen years of age were included and those were sick or absent on day of data collection were excluded.

Study tools:

A pretested, predesigned, structured questionnaire consisting of four sections was used (Demographic data survey tool, Pattern of Internet usage, Young's Internet Addiction Test and The Duke Health Profile). Pretesting was done by a pilot study conducted on sample size of 20. Face value was established by expert analysis. Young's Internet Addiction Test has a very good Internal Consistency, with a Cronbach alpha coefficient of 0.93. It has twenty questions that are graded from Rarely (1), Occasionally (2), Frequently (3), Often (4) and Always (5). A total score that does not exceed 30 indicates a normal level of internet consumption, whereas total scores between 31-49 indicates mild level addiction, 50-79 designates moderate level addiction and score of 80 or above reflect a severe internet dependency.

Duke Health Profile is copyrighted by The Department of Community and Family Medicine, Duke University Medical Centre, Durham, N.C., USA. Permission to use the study tool in this dissertation has been granted by the concerned authorities. It consists of 17 items covering physical health, mental health, social health, self-esteem, anxiety, depression, pain and disability. Score ranges from minimum of 0 to maximum of 100. These questions are responded by three options which are attached to a raw score pre-fixed in the test. This raw score is further used to calculate Final score of different psychopathologies -Physical Health Score, Mental Health Score, Social Health Score, General Health Score, Perceived Health Score, Self Esteem Score, Anxiety Score, Depression score, Anxiety-Depression (Duke-AD) Score, Pain score and Disability Score.

Data analysis:

Questionnaire was self-administered in hard copies after explaining about the study ensuring voluntary participation. Researcher also dictated the questions during the data collection period for higher reliability and ease of understanding of participants.

Data analysis:

After checking for completeness and consistency, data was entered in SPSS 26 for windows (IBM Corp. Chicago, U.S). It was then summarized using the descriptive statistics of mean, standard deviation, frequency and percentage. Associations were analyzed using Unpaired t-test, ANOVA with post hoc Tukey test and Pearson Correlation. Binary logistic and Multiple Linear Regression model were used to identify the predictors. For binary logistic regression, participants with Moderate and Severe Internet addiction scores were grouped as 'Internet Addicts' while those with Mild or No Internet addiction were grouped as 'Not addicts'. P-Value < 0.05 was considered as statistically significant.

Results:

From four colleges of different streams 400 participants, 100 first- and second-year college students from each, were recruited in this study. Mean age was 18.7 + 0.8 years with majority being females (62.5%). Majority, 358 (89.7%) possessed 'Personal' internet enabled mobile phone. Around 13.4% participants were Overweight and 1.6% participants were Class I Obese. Mean Screen Time during weekdays was 1.8 + 0.7 hours while on weekends it significantly increased to 2.8 + 1.1 hours (p<0.01).

Young's level of Internet Addiction:

Mean Internet addiction Score was found to be 49.6 + 14.9 with a maximum score of 88 and a minimum score of 21. Majority of participants were having Mild (181, 45.2%) or Moderate Internet addiction (144, 36.0%). Severe Internet addiction was seen in 24 (6.1%) participants. No Internet addiction was observed in 51 (12.7%) participants.

There was no significant association between Internet addiction Score and sociodemographic factors of stream, age, sex, parental education and occupation. High degree of correlation was seen with Amount of pocket money (r=0.68, p<0.01) and Monthly expenditure on Internet (r=0.63, p<0.01). Notable associations between pattern of Internet usage and Internet addiction score have been Mukherjee et al

Internet Addiction Among College Students...

Table 1 : Difference between Internet Addiction Scores among Students According to their Characteristics			
Characteristics of students	n (%)	Internet Addiction Score (Mean <u>+</u>	p-Value
		Standard Deviation)	
Stream of college			
Medical	100 (25.0)	51.2 <u>+</u> 13.4	0.29*
Engineering	100 (25.0)	50.8 <u>+</u> 15.1	
Physiotherapy	100 (25.0)	47.8 <u>+</u> 15.9	
Humanities	100 (25.0)	48.5 <u>+</u> 15.2	
Gender			
Male	150 (37.5)	50.0 <u>+</u> 14.9	0.93 [#]
Female	250 (62.5)	49.3 <u>+</u> 15.0	
Main purpose of Internet Usage	1		
Education	142 (35.5)	43.5 <u>+</u> 14.1	< 0.01*
Social Networking	132 (33.0)	54.1 <u>+</u> 15.6	
Gaming	96 (24.0)	54.8 <u>+</u> 13.5	
Listen to songs	20 (5.0)	36.5 <u>+</u> 8.3	
Downloading Media	10 (2.5)	50.1 <u>+</u> 9.7	
Usual Posture of Internet Usage			
Sitting	281 (70.3)	45.6 <u>+</u> 12.4	< 0.05 #
Lying down	119 (29.7)	58.9 <u>+</u> 16.2	
Most Frequent Time of Usage	1		
Morning	203 (50.7)	52.1 <u>+</u> 12.4	0.03*
Noon	78 (19.4)	48.1 <u>+</u> 12.3	
Evening	52 (13.1)	44.7 <u>+</u> 12.7	
Night	67 (16.8)	64.1 <u>+</u> 16.9	
Usual place of Internet Usage	•		
House/Hostel	198 (49.8)	50.4 <u>+</u> 15.2	0.38*
College	189 (47.3)	49.5 <u>+</u> 14.8	
Internet Café	13 (2.9)	44.6 <u>+</u> 7.1	
Personal Ownership of Internet Enal	bled Mobile Pho	one	
Yes	358 (89.7)	50.9 <u>+</u> 14.8	< 0.01 #

[#]Anova followed with Post-Hoc Tukey Test

*Independent t-test

No

mentioned in Table 1. Participants who used Internet mainly for Social media usage or Gaming purposes, at night (p=0.03) were found to have statistically significantly higher Internet addiction Scores than other uses as established by Post-hoc Tukey analysis. Participants whose posture of internet usage was 'lying down', those with frequent usage at night time and who owned internet enabled mobile phone had significantly higher Internet addiction Scores.

Duke Health Profile:

37.9<u>+</u>11.1

Internet addiction Score was significantly negatively correlated with Mental (r=-0.33, p<0.01), Social (r=-0.43, p<0.01) and General health (r=-0.40, p=0.01) scores but significantly positively correlated with Anxiety (r=0.44, p<0.01), Depression (r=0.19, p<0.01) and Duke-AD (Anxiety-Depression combined) score (r=0.36, p<0.01). There was negative correlation between internet addiction scores and physical health (r=-0.09, p=0.06),

42 (10.3)

Table 2 : Binary Logistic Regression for association between variables of Interest and 'Internet Addicts' (N=400) **Risk factor of internet addicts** cOR (95% Confidence Interval)^{*} aOR (95%Confidence Interval)[#] Amount of pocket Money Below Rs. 2,910 1 1 Above Rs. 2.910 1.8(1.5 - 2.1)4.3(2.4 - 7.4)Monthly Internet Expenditure Below Rs. 203 1 1 Above Rs. 203 2.1(1.5 - 2.7)2.8(1.6 - 4.7)**Ownership of Internet Enabled Mobile Phone** No 1 1 3.8 (1.7-8.9) 3.9 (1.4-11.1) Yes Posture while accessing Internet Sitting 1 Lying Down 2.2(1.7 - 2.9)4.85 (3.06-7.69) Usual time of Internet Access Morning 1 1 Noon 2.6(0.3-10.1)1.4(0.8 - 2.7)Evening 6.2 (1.0-37.8) 2.2(1.1 - 4.5)34.2 (7.6-152.8) Night 8.7 (4.1-18.6)

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* Crude Odds Ratio

[#] Adjusted Odds Ratio

perceived health (r=-0.06, p=0.2), self esteem (r=-0.05, p=0.4) and positive correlation with pain (r=0.03, p=0.5) and disability (r=0.05, p=0.4) but these findings were not significant.

Table 2 showed that higher than mean pocket money, higher than mean monthly Internet expenditure, ownership of internet enabled mobile phone, 'lying down' posture while internet usage and evening or night time internet usage were significant predictors for 'Internet addicts.'

Multiple Linear Regression Prediction Model:

A multiple linear regression was calculated to predict Internet addiction Score based on Monthly Pocket Money, Monthly Internet Expenditure, Screen time during weekends, Duke AD score and Social Health Score. A significant regression equation was found ($F(n_1-1, n_2-1)=117.96$, p <0.001), with an R^2 of 0.62. Participants' predicted Internet addiction Score was equal to 28.56 - 0.14 (Social Health Score) + 0.004 (Monthly pocket money) + 0.05 (Monthly Internet Expenditure) + 0.15 (Duke AD Score) + 3.38 (Screen time during weekends) where Indian Rupees was measuring unit for monetary variables. All these variables were significant predictors of Internet addiction Score.

Discussion:

In this study, IA criterion was fulfilled in 87.3% participants which is similar to study done by Jaiswal et al. (93.8%).^[7] Upon seeing different levels of IA, Mild IA prevalence was similar to studies done by Christian et al.^[11], Damor et al.^[12] however Moderate Internet addict category has seen a marked increase (17.4%, 17.2% respectively). In this study Mean IA Score was found to be 49.6 <u>+</u> 14.9. In a study done by Singh et al.^[13] mean IA Score was found to be $32 \pm$ 16.42. IA rate was found to be much higher than similar studies conducted during COVID-19 pandemic by Lin et al. $(24.4\%)^{[14]}$, Siste et al. (19.9%)^[15] and Khubchandani et al. (55.0%)^[16]. This difference can be attributed to demographic differences and also difference in scales used. Increased reliability on Internet for education, reduced outdoor time, cheap and faster availability of Internet specially during COVID-19 pandemic might have a significant role in this regard.

In current study, participants spending more than mean Monthly Internet Expenditure had 2.8 (1.6-4.7) times higher odds of becoming an Internet addict. Similar results were seen in studies done by Veena et al. $(x^2 = 42.59, p=0.0007)^{[17]}$ and Krishnamurthy (OR=2.31, p=0.002)^[6]. There was also a high degree of correlation (r=0.68) of Internet addiction score with Monthly pocket money received by the participants. These relations show us the importance of self-restraint and increment of IA when financially sound.

In present study Ownership of Internet enabled mobile phone was found to be significantly associated with IA. In his study Sharma et al.^[18] showed that IA was higher among participants who have their own Internet enabled mobile phone. Similar results were seen in this study. Previous studies done by Anand et al.^[10] and Krishnamurthy et al.^[6] revealed male preponderance among Internet Addicts. However, in this study results were contrary as there was no significant difference across both genders. This may be due to Internet usage has been generalized across all genders and time variation across different studies.

Christian et al.^[11] conducted a similar study across five colleges of different streams. In his study he found that students of Science College were least addicted and Commerce students were the most affected by IA. However, the difference was not significant. In this study all the colleges had similar IA Scores. Online education is being used as a tool by all streams. Easy learning slope of Internet usage for education purposes has made Internet a very reliable and popular tool. Also, Internet is used for entertainment by all streams equally causing a similar outcome for different streams.

Screen time is a direct factor for IA screening. It is the time spent in front of any device which may or may not have Internet Access. However, accurate calculation is difficult as general use includes multiple apps and devices. In this study, significant association was found between Screen time and IA. Similar results were seen in studies done by Anand et al. $(OR=3.7, p<0.001)^{[10]}$, Krishnamurthy et al. $(OR=2.4, p<0.001)^{[6]}$, Veena et al. $(x^2=42.5936, p<0.001)^{[17]}$ and Durkee et al. (F(2, 11566) = 480.11; P < 0.001)^[19]. There was also a significant increase in screen time usage during weekdays and weekends. Participants get free time during weekends which allows them to use Internet at will which contributes to the growth of IA.

Internet has been used for multiple purposes by participants. In this study, educational purposes were reported as the most common purpose of usage. Damor et al.^[12] reported social media usage (65.2%) as the most common use. Durkee et al.^[19] reported social media and gaming usage as the most common use. This may be due to the fact that data collection of this study was done before and after 2nd wave of COVID-19 pandemic in India, in which period online classes and assignment were focused upon. However, IA was found to be significantly higher in participants who usually internet for gaming and social media purposes. This sub group analysis result was similar to findings of Durkee et al.^[19]

In this study, IA Score was significantly correlated with Mental Health Score (r=-0.33), Anxiety Score (r= 0.44), Duke AD Score (r=0.36), Social Health Score (r=-0.43). Goel et al.^[20] and Veena et al.^[17] reported similar findings. Jaiswal et al.^[7] conducted a study on Social anxiety by using Social interaction anxiety scale (SIAS) and found high correlation with IA (r= 0.994, p< 0.001). People with poor mental health tend to find solace in their virtual life and tend to escape from social interactions creating a vicious cycle.

Conclusion:

In this study, almost nine of every ten participants were found to have some level of internet addiction. Higher pocket money, Greater monthly internet expenditure, ownership of internet enabled mobile phone, evening or night time usage, and 'lying down' posture while internet usage were significant predictors of internet addiction.

Recommendation:

College administration and department of Health can collaborate for screening of addiction using similar tools followed by diagnosis and management of addiction cases discovered during the process. Monitoring of student's monthly expenditure by parents can be helpful in discouraging excess internet usage. Evening or night time usage needs to be controlled. Parents and teachers should also be educated to recognize early signs of deteriorating general and mental health due to internet addiction.

Strength and Limitations:

Being a cross-sectional study, temporality of COVID-19 pandemic on IA cannot be established. However detailed comparison with similar studies across different time frame was done to minimize the limitation. A self-reported questionnaire was used hence there is a chance of participants giving socially acceptable answers. Also, the four colleges were chosen purposively which limits generalizability of the results. Use of validated questionnaires and participant's willingness to participate were some of the strengths of this study.

Declaration:

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Conflict of Interest: Nil

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Comparison of Demography, Resource Utilization and Outcomes of COVID 19 patients admitted during First and Second waves at a tertiary care institute in Kanyakumari, South India

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Abstract:

Introduction: The novel Coronavirus disease 19 (COVID-19) affected India, predominantly in two time periods – the first wave from March to December 2020, and the second wave that raged from April to July 2021. Although the time duration of second wave was shorter than the first, the onslaught of the disease was much more severe during the second wave. **Objective:** To compare the demographic characteristics and clinical outcomes of COVID-19 patients admitted during the first and second pandemic waves. Method: Demographic characteristics, duration of hospitalization, critical unit admission, and mortality data of 137 and 345 COVID-19 positive individuals, from first and second waves respectively, were retrospectively analyzed in a teaching hospital in South India. Descriptive statistics, Independent t test, chi square tests and regression analysis were used for statistical analysis, with significance level prefixed at 5%. Results: Median age of hospitalisation was 46.2 years and 48.39 years during first and second waves respectively, with male preponderance in second wave. There was a statistically significant difference in mean duration of stay (9.04 days v/s 7.53 days), mean Spo2 at admission (98.4% v/s 96.6%), ventilation requirement (1.5% v/s 8.7%), oxygen requirement and ICU care between the two waves. **Conclusion:** During the second COVID wave, significantly higher hospitalisation rates, intensive care requirements and inpatient mortality was observed. Elevated C Reactive Protein levels, lymphocytopenia, history of diabetes and other co-morbidities were associated with poor outcomes in both waves.

Key Words: COVID-19, Critical care, Demography, Outcome

Introduction:

Following the initial outbreak in Wuhan, China, the global Coronavirus disease 2019 (COVID-19) pandemic began in March 2020. It has since spread to every country on the planet.^[1] It is a respiratory disease of varying severity caused by the SARS-CoV-2 virus.^[2] India, the second most populous and diverse country, bore the onslaught of the first COVID-19 wave from March to December 2020. The second wave began abruptly in April 2021 and gradually declined by July 2021.^[3] The second wave came as a surprise, putting the under-prepared health-care system under severe strain. The increase in cases was rapid, and media organizations reported a shortage of essential medicines, oxygen, and hospital beds.^[4-5]

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The literature on similarities and differences in disease characteristics between the two waves in India is limited to a few studies from tertiary care centres based in Indian cities. The various disease characteristics and predictors of adverse clinical outcomes from different hospital settings need to be explored. Such a comparative study between clinical courses of different strains of pandemic causing virus will help in preparation and management of future outbreaks. This study was aimed at identifying the differentials in demography, clinical course and the outcomes of RT-PCR positive hospitalized COVID-19 patients during the first and second waves in a rural teaching hospital located in southern part of India.

Method:

This record based study was conducted in a tertiary care teaching institute in Kanyakumari district, Southern Tamil Nadu, India. For the purposes of this study, COVID Wave-1 was defined as the period from April to December 2020, and COVID Wave-2 as the period from April to June 2021^[3] Case files of 137 COVID-19 patients in COVID wave 1 and 485 patients in COVID wave 2, confirmed with Real Time Polymerase Chain Reaction (RT-PCR) positive results, were retrospectively analysed. The study was approved by Institutional ethics committee [IHEC No: 1/ Protocol no: 56/ 2021 dated 06-09-2021].

All adult and pediatric patients who were hospitalised in COVID wards with positive RT-PCR, obtained from a nasopharyngeal swab were included in the study. Those patients who got discharged against medical advice were excluded from the study. Along with the demographic data, duration of hospitalization, ICU admission, and mortality data of both the waves were collected, tabulated, and analysed. Clinical outcomes like admission to Intensive care units (ICU), oxygen supplementation required, Non Invasive Ventilation (NIV) required were recorded. Biochemical parameters like C Reactive protein (CRP) levels, D DIMER levels, lymphocyte counts (LC) were recorded. Lymphocyte counts less than 20% were defined as lymphocytopenia. Clinical history of diabetes (DM), hypertension and other co-morbid medical conditions like cardiovascular diseases (CAD), chronic kidney disease (CKD), hypothyroidism, malignancy, etc were also recorded. Discharge was advised when the patient turned COVID negative on a RT PCR test on nasopharyngeal swabs.

Statistical Package for the Social Sciences (SPSS) version 22 was used for statistical analysis. Descriptive statistics, Fishers exact tests, Independent t tests, and chi square tests were used for statistical analysis. Categorical variables were compared between waves using a Chi square (χ 2) test and Fishers exact test. Significance level was fixed at 5%.

Results:

In this study, 137 patients admitted during the first wave of COVID-19 during the months of April –December 2020 and 345 patients admitted with confirmed COVID during second wave in April –June 2021 were included, to give a total sample of 482 patients. The age group distribution of the patients across both waves is as given below in Figure 1.

In the first wave, there were 137 patients admitted. Mean age of the patients was 46.2 years + Standard deviation (SD) of 18.5 years. A majority of patients were of the 18-59 age group (66.4%), while elderly patients (aged more than 60 years) formed slightly more than a quarter of the patients (27%) and children below 18 years formed 6.5% of the patients. Also, majority of patients admitted were males when compared to females (54% versus 46%).

In Second wave, the mean age of the patients was higher than 2020 wave at 48.39 years (\pm 19.3 SD). However this was not statistically significant (p>0.05; Independent t test). While the 18-59 year age group remained the predominant group out of the three age groups at 59.4%, more elderly people and children were admitted at 33% and 7.5% of the total patients respectively. There was a similar gender pattern as seen in previous year with 54.8% males versus 45.2% females.

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In first wave, history of Diabetes Mellitus was seen in 35% cases and hypertension in 22.6% cases. Other co morbid conditions were seen in 19.7% cases. In second wave, out of the 345 cases admitted, 45.8% (158) cases had pre existing Diabetes Mellitus and 19.4% (67 cases) had pre existing hypertension. Moreover, 13.3% cases had some other associated comorbid condition. The overall prevalence of comorbidities other than hypertension and diabetes in this study across both waves was 15.14% with predominant conditions being CAD (39.7%), CKD (10.9%), malignancy (10.9%) and hypothyroidism (8.2%).

Clinical course:

The clinical course of patients in hospital during first wave ranged from 1 to 77 days of hospital stay with the mean duration being 9.04 days (\pm 2.9 days SD). The mean SpO2 at the time of hospital admission was 98.4% (\pm 1.5%). Out of the 137 patients admitted during the first wave, 1 patient died giving a case fatality rate (CFR) of 0.7% and referral rate was 4.38% (6 referrals). The recovery rate was 94.89% with 130 cases being discharged after turning COVID RT-PCR negative. ICU care was required in 1.5% cases with 1.5% cases requiring NIV and 0.7% (1case) requiring intubation. Oxygenation was supplemented in 7.4% cases. Dialysis was not required for any case during first wave. Enoxaparin and steroids remained the mainstay of treatment in 74% and 29.4% cases respectively with Remdesivir being used only in 5.8% cases. The mean values of biochemical parameters are as given below in Table 1. The proportion of cases with Lymphocyte count less than 20% (lymphocytopenia) was 26.3%.

During second wave, the clinical course ran for a shorter mean duration of 7.53 days (\pm /- SD 5.2 days). This difference in mean days of hospital stay was statistically significant (independent t test; p < 0.05). The mean SpO2 at the time of admission was also lower, i.e, 96.65% (\pm 2.9%). This was also statistically significant as per independent t test with a p value less than 0.05. The recovery rate was 89.85% and CFR was 2.3%. The proportion of cases with lymphocytopenia was 31.3%.

A higher proportion of patients required ICU care in Second wave than first wave, this difference being statistically significant (p<0.05). Moreover, patients needing intubation (2.6%), NIV (8.7%), oxygenation



Figure 1: Age distribution of patients in first wave (N1=137) versus Second wave (N2=345)

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Clinical course	First wave	Second wave	Statistical	p value
	(N1=137)	(N2=345)	test value	
	n (%)	n (%)		
Steroids treated	40 (29.4%)	162 (47%)	11.66*	0.001*
Remdesivir Treatment	8 (5.8%)	57 (16.5%)	9.59 [#]	0.002*
Enoxaparin treated	21 (74%)	162 (47%)	37.73*	<0.001*
ICU care required	2 (1.5%)	31 (9%)	8.708 [#]	0.003*
Oxygenation required	10 (7.4%)	48 (13.9%)	3.959*	0.047*
Intubation required	1 (0.7%)	9 (2.6%)	1.7*	0.192
NIV required ⁺	2 (1.5%)	30 (8.7%)	8.23*	0.004*
Number of deaths	1 (0.7%)	8 (2.3%)	1.35 [#]	0.245
Biochemical parameters				
Mean CRP level	20.03	22.26	-0.67 ^{\$}	0.503
Mean D- DIMER	342.89	398.07	-0.733 ^{\$}	0.464
Mean Ferritin	269.84	322.43	-1.067 ^{\$}	0.287
Mean Lymphocyte count	29.18	26.76	1.801 ^{\$}	0.072
Cases with Lymphopenia	36 (26.3%)	108 (31.3%)	1.18#	0.277

Table 1 : Comparison of Clinical Course And Biochemical Parameters inFirst wave (N1=137) Versus Second wave (N2=345)

#Chi square test; \$Independent t test; *statistically significant (p<0.05); +NIV- Non Invasive Ventilation

(13.9%) and dialysis (1.2%) also increased in second wave. The differences in patients requiring Remdesivir, Steroids and Enoxaparin in 2021 versus 2020 were also statistically significant as shown in detail above in Table 1.

Factors affecting clinical course and outcomes:

The detailed description of factors affecting the clinical outcomes of mortality, NIV, intubation and O2 supplementation are described below in Table 2. Patients who had co-morbid conditions like CAD, CKD, etc were statistically more likely to die than patients without co-morbid conditions. Deaths also had a statistically significant association with elevated CRP levels. There was a statistically significant higher rate of intubation in patients who had co-morbid conditions and elevated CRP levels. NIV was statistically associated more with diabetic patients, patients with co-morbidities, elevated CRP categories and lymphocytopenia.

Oxygenation was required more for male patients, patients with co-morbidities, diabetes, lymphocytopenia and elevated CRP levels. All these associations were highly statistically significant with p value less than 0.01. Conversely, a higher proportion of patients below 60 years required oxygenation when compared to elderly patients and this was statistically significant.

Dialysis requirement was higher in patients with co-morbid conditions than those without any associated conditions (p value 0.012, Fisher's exact test). This may be because upto 10.96% (8) of patients with co-morbid conditions had CKD and COVID could have aggravated their renal dysfunction.

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Factors	Ν	De	eaths	Intu	bation	N	IV	02 tl	heraphy
		Yes	Critical	Yes	Critical	Yes	Critical	Yes	Critical
		n=9	value (p)	n=10	Value (p)	n=32	value (p)	n=59	value (p)
Comorbid con	nditions	1	11			I	1	1	
Present	73	8*	38.81*	8*	33.42	12 [*]	0.001\$	20*	18.39#
Absent	409	1	< 0.001	2	< 0.001	20		39	< 0.001
Elevated CRP									
Yes	256	8*	4.71#	9 [*]	0.023*	25 [*]	8.61*	47*	19.03 [#]
No	226	1	0.03	1		7	0.003	12	< 0.001
Lymphocytop	penia								
Present	144	4	0.462 ^{\$}	5	0.751 ^{\$}	20*	17.41 [#]	32*	19.04#
Absent	338	5		5		12	< 0.001	27	< 0.001
Diabetes Mel	litus	•							
Present	206	4	0.586 ^{\$}	5	0.751 ^{\$}	20*	5.47*	37*	10.96*
Absent	276	5		5		12	0.019	22	0.001
Gender	Gender								
Males	263	6	0.52 ^{\$}	7	0.36 ^{\$}	19	0.32*	42 [*]	7.49*
Females	219	3		3		13	0.572	17	0.006
Age category									
>60 years	151	4	0.471 ^{\$}	5	0.299 ^{\$}	15	3.85*	28	8.13 [#]
<60 years	331	5		5		17	0.05	31*	0.004

Table 2 : Factors affecting clinical outcomes in COVID patients across both waves (N=482)

*Statistically significant (p<0.05)# Chi-square test; \$Fishers exact test

Regression analysis was done on the factors which had a statistically significant association with clinical course outcomes using binary logistic regression model. The statistically significant predictors of requirement of NIV and oxygen supplementation therapy after excluding the factors not significant from the regression model are as given below in Table 3.

The total number of Healthcare Workers (HCW) infected was 17 and 14 in the first and second waves respectively. All infected HCWs were asymptomatic or had mild disease and were discharged after short hospitalization. There was no intensive care requirement or mortality among HCWs.

Discussion:

Despite aggressive and extensive measures to control the pandemic by governments around the

world, the SARS-CoV-2 virus continues to mutate into highly contagious variants. The second major variant of concern, the delta CoV (Indian strain; B.1.617.2) caused widespread illness during second wave. This was the reason for the phenomenal speed of the COVID 19 spread during the second wave. Even though preferential vaccination for individuals above 60 years was provided by the government of India, due to limitations in vaccine coverage it did not succeed in bringing down the hospitalization in that age group during second wave.^[6] Due to closure of educational institutions children and young adults faced less exposure during both the waves.^[7,8]

In this study, a statistically significant difference was found in mean duration of stay (9.04 days v/s 7.53), mean SpO₂ admission (98.4% v/s 96.6%), NIV requirement (1.5% v/s 8.7%), oxygen requirement (7.4% v/s 13.9%), ICU care, and use of Remdesivir,

Outcome	Predictors	Nagelkerke R ²	P value	Adjusted OR
NIV	Elevated CRP	0.144	0.048*	2.49
	Lymphocytopenia		0.005*	3.09
	Co-morbid conditions		0.018*	2.67
Oxygen therapy	Elevated CRP	0.174	0.001*	3.13
	Lymphocytopenia		0.007*	2.25
	Co-morbid conditions		0.006*	2.5
Intubation	Elevated CRP	0.287	0.086	6.29
	Co-morbid conditions		< 0.001*	21.85
Death	Elevated CRP	0.338	<0.001*	44.09
	Co-morbid conditions		0.123	5.33

Fable 3 : Regression Model of Predictors of Adverse Clinical
Outcomes in COVID cases (N=482)

*Statistically significant (p<0.05)

Steroids, Enoxaparin in treatment between the first and second COVID waves. A retrospective crosssectional study from Dhaka Medical College Hospital among 100 confirmed COVID-19 patients in May 2020 showed a younger mean age of patients as 41.7 \pm 16.3 years with a male preponderance (63%). Hypertension (21%), diabetes mellitus (16%), heart diseases including ischemic heart disease (IHD) (8%) and renal diseases including chronic kidney disease (CKD) (8%) were frequent co-morbidities.^[9] Frequency of comorbid conditions other than diabetes and hypertension in the Dhaka study were similar to the present study, though the mean age in this study was higher (46.2 years) in 2020. The presence of diabetes and hyperglycemia led to worse outcome among COVID patients in this study. Similar correlation was found between diabetes and worse outcome in COVID was also noted in a study by Aman Rajpal et al.^[10]

Increase in C Reactive Protein was related to severity of the disease as per this study which was in line with the study conducted by Sharifpour et al in 2020.^[11] The incidence of lymphocytopenia was related to have worse outcomes in this study which was similar to the study conducted by Qianwen Zhao et al. ^[12] Jain et al reported that, in addition to the

older persons, the pediatric and younger individuals were also more infected in India in the second wave, which is not in line with findings in this study.^[5] Revathishree K et al described a similar mean age (41years) and gender distribution in first wave in Chennai in 2020. They had a mortality rate of 0.8%, slightly higher than 0.7% mortality rate in 2020 in the present study.^[13] However, in the second wave, mortality rate in this study was higher as were the adverse outcomes like ICU admission, use of steroids, NIV etc. This was mirrored in a similar study depicting differentials among 19,852 RT-PCR confirmed COVID-19 patients in first and second COVID waves in North India by Budhiraja et al. They too had higher levels of mortality, up by almost 40%, more O2 therapy, similar ICU admission rates, and more cases requiring invasive ventilation. Also, they had a higher number of hospitalizations in patients with co-morbidities in wave 2.^[14] Similar findings were noted in the present study also.

A retrospective study of 550 hospitalised cases of SARS-CoV-2 infection in South Africa^[15] compared the characteristics, biological severity markers, treatments, level of care and outcomes of the patients during the two waves. During the second wave the admissions were of significantly older patients,

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which are reflected in this study too. Also, there were more patients without any co-morbidities during second wave, which is in contrast to this study. Patients admitted to the ICU and/or were mechanically ventilated were much lower in number during second wave, as opposed to this study. Their observation of overall increased mortality figures in the second wave is in agreement with this study.^[15]

Conclusion:

COVID-19 has challenged the Indian healthcare system with its extent, speed of spread and constantly mutating variants. In contrast to first wave in 2020, 2021 wave had more adverse outcomes and mortality, despite shorter duration of hospitalization. Associated comorbid conditions, elevated CRP levels and lymphocytopenia were the predictors of adverse clinical outcomes in COVID identified in the present study.

Declaration:

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Conflict of Interest: Nil

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A Cross-Sectional Study to Assess the Prevalence of Obesity among Second Professional MBBS Students of One of the Medical Colleges of Indore, Madhya Pradesh

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Abstract:

Introduction: Obesity is a complex multifactorial preventable disease. The problem of obesity is important to discuss because it is closely associated with an increasing risk to many diseases. **Objective:** To assess the prevalence of obesity among Second MBBS students and find the anthropometric parameters of obesity. **Method:** This was a cross-sectional, observational study conducted among 100 second MBBS students. Demographic data and anthropometric measures, such as Height, Weight, Body mass index, Waist circumference, and Waist/Hip ratio of the students were collected. **Results:** BMI was < 18.5 in 17.34% of male and 28% of female students. Around 18.67% of male and 24% of female students had BMI of more than 25 and where as student shaving BMI of more than 30 were 6.66% and 4% in male and female students, respectively. According to the *Waist/Hip ratio*,16% male (>0.95) and16% female (>0.86) students were categorized as at risk for obesity (p-value 0.86). **Conclusion:** Almost half of the male and female students were having normal BMI. More number of female students had BMI lower than normal. Students falling in the category of overweight were higher as compared to obese students. Such students were advised for non-pharmacological measures of weight reduction through proper exercise, consuming a healthy balanced diet, and role of physical activity, so as to maintain proper bodyweight and to prevent future complications of obesity were advised to the students.

Keywords: Body mass index, Obesity, Prevalence

Introduction:

Overweight and obesity, as well as their related non communicable diseases are largely preventable and the fastest growing public health problems in developed and developing countries.^[1] It is a "New world syndrome" which affects all age groups.The problem of obesity has tripled in the past decade, and it currently affects approximately 30-35% of the general population in the USA and 25% in the UK,by 2030 an estimated 38% of the world adult population will be overweight, and another 20% will be obese.^[2] Currently, the global prevalence of obesity in children and adolescents is 7-10% and is speculated to double by 2025. Obesity is associated with an increasing risk of mortality and morbidity as compared to those who have an ideal body weight.^[3] Even a moderate weight reduction in the range of 5-10% of the initial body weight improves overall health.^[4] The problem of obesity is important to discuss because it is closely associated with increasing risk of cardiovascular disease, dyslipidemia, hypertension, diabetes type

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II,stroke,PCOD, obstructive sleep apnea, thyroid, etc. The burden is increasing due to increasing economic growth, industrialization, transportation facilities, urbanization, sedentary lifestyle and nutritional transition to high calories processed diet. It is a complex disease which also have genetic, behavioral, socioeconomic, and environmental factors. It is also associated with a psychosocial stigma which is added by economic costs when coupled with comorbidity.

Several indirect methods widely used to measure obesity are anthropometric measures such as Body mass index (BMI), waist circumference (WC), Waist/Hip ratio(W/H ratio).BMI is a measure of weight corrected for height and which reflects the total body fat and has been the most accepted parameter for defining overweight.^[5]Obesity is defined as BMI of >30 kg/m² and is largely due to an imbalance between, calories intake and expenditure. (According to WHO overweight is a BMI >25 and obesity is a >30).^[1]

A waist circumference >102 cm in men and > 88 cm in women is an estimate for central obesity.The waist –hip ratio is the dimensionless ratio of the circumference of the waist to that of the hips.This is calculated as the waist measurement divided by the hip measurement.The normal W/H ratio is<0.90 in male and < 0.85 in females.^[6]

Medical students being future doctors are role models for society for reflectinga healthy lifestyle. Many researcharticles suggest that obesity is increasing among them due to unhealthy eatinghabits,lack of physical activity and stress.^[7]Moreover, due to COVID -19 pandemic, they had to remain indoors, due to imposed lockdowns. Also, they were bound to study through e-learning while sitting in their homes. So, this study was planned when they resume their offline learning in the institute to assess prevalence of obesity among them. Authors also tried to create awareness regarding obesity and its complications as to maintain a healthy body.

Method:

A cross-sectional observational study was conducted during September to November 2021.The second professional MBBS students of the 2019 batch of MGM Medical College, Indore were selected purposively for the study. Those who consented to participate in study were requested to fill the questionnaire having basic demographic details of the students. Only one student, who was prescribed an antipsychotic drug, was excluded from the study. A total of 100 students were recruited for the study according to convenient sampling method. Assessment of obesity was carried out by using the BMI formula: BMI = Weight (kg)/height(m²), Normal range for BMI is 18.5-24.9 kg/m² (as per WHO).^[8]

The weight of the students was measured by using a calibrated weighing machine, wearing light weight cloths, and removing heavy items from the pockets and weight was recorded to the nearest kilograms. For recording the height of subjects, a vertical measuring scale was fixed to wall and students were asked to remove shoes and stand on flat floor in front of measuring scale with the feet parallel and heels, buttock, shoulder and back of head touching vertical scale. The head was held completely erect with lower border of orbit in the same horizontal plane as the external auditory meatus. The arms were kept hanging by the sides in natural manner. The horizontal bar of the measuring scale was lowered to touch the head. The height was recorded to the nearest centimeter (cm).

Grading of BMI was done according to WHO grading, in which individuals with BMI below 18.5kg/m² are underweight, individuals with BMI ranging from 18.5-24.9 kg/m² are considered normal,those with BMI ranging from 25-29.9 kg/m²are overweight and those with BMI above 30 are considered obese.

For waist circumference measurements the students were made to stand with feet 25-30 cm apart, weight evenly distributed. Measurement was
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taken midway between the inferior margin of the last rib and the crest of the ileum in a horizontal plane.Waist circumference was measured to the widest part of the buttocks.

The authors also recorded about the physical activity, dietary preference, addiction history and history regarding hypertension, diabetes, and thyroid disorder in the structured proforma.All data was entered into a Microsoft excel sheet and statistical analysis was done using SPSS version 21,p>0.05 was considered statistically significant. The association between overweight/obesity and various factors was done using the Chi-square test.Ethics clearance was obtained from the institutional ethics committee.

Results:

Out of total 100 students enrolled in the study, there were 75 male and 25 female students. Around 17% male and in 28% female students had BMI< 18.5.BMI was normal in 57% male and 40% female students, where as 19% male and 24% female students were overweight and 7% male and 8% female students were obese.But these findings were statistically insignificant on performing chi-square test(p value 0.48)(Figure 1).

As shown in Figure 2, Waist /Hip ratio was excellent (<0.85) in 18(24%) male and 6(24%) female students (<0.75). W/H ratio is at risk of obesity in12 (16%) male (>0.95) and 4(16%) female students (0.86). These results are also found insignificant statistically using chi-square test (p value 0.97).

Various contributory factors associated with obesity were also assessed using questionnaire. Out of total 100 students 48% male and 84% female students were vegetarian while and 36% male and 16% female students were non-vegetarian.

When authors inquired about their physical activity, it was found that 76% male and 56% female students were havingmoderate physically activity. This result also not found statistically significant. (p value 0.158)(Figure 3)

Out of total participants, only one male student having hemophilia taking factor VIII and one female student having anxiety disorder was on etizolam and desvenlafaxine.Family history revealed history of Diabetesin student's parents of 28%, Hypertension in 29.33%, Hyperthyroidismin 12% and Hemophilia in 1%.



Figure 1 : Distribution of students according to BMI (N=100)



Figure 2 : Distribution of students according to Waist/Hip ratio (N=100)

*Students have been categorized using WHO waist/hip ratio^[5]





Discussion:

This study was done for the assessment of obesity in medical students.Out of total 100 students participated; prevalence of obesity was found more among male as compared to female students. Thehigher prevalence of obesity found among boys may be due to the fact that being more outdoors,they tend to eat more junk food such as fried snacks, and fast-food items. Girls consume less calories as they perceive more about body image correctly and try to change their body weight towards normal. Also, girls perform more household activities as compared to boys. While some previous studies indicate an increased prevalence of obesity/overweight among female students. ^[9-11]During COVID, students were confined in their homes andspent many hours watching television, mobiles, and computers. This extra screen time was also due to online teachinglearning. This also added to their less physical activity leading to overweight.

In current study, it was found that females had higher waist circumference as compare to that of males. This may be due to hormonal imbalance among them or consumption of extra-calories. Abdominal obesity which occur because of visceral fat deposition is associated with cardiovascular risk such as Hypertension, Type II Diabetes and Dyslipidemia.^[12]In a study from north Chennai,India found that less physical activity, consuming junk food and watching television are associated with higher prevalence of obesity.^[13]A study done by Debnath at almentioned about positive correlation between waist circumference and BP (systolic, diastolic and mean) among female students aged 16-22 years.^[14]The overweight students are more at risk of developing obesity and related co-morbidities.^[15-17]

Present study also revealed a large number of students to be underweight. These nutritionally deficient students may suffer from anemia, lack of concentration toward studies, weakness. This might result in decreased academic performance of students.

Limitation of the study:

Only second MBBS students were selected for the study so the findings cannot be generalized.

Conclusion:

Almost half of the male and female students were having normal BMI. More number of female students had BMI lower than the normal. Students falling in the category of overweight were higher as compared to obese students. Such students were advised for non-pharmacological measures of weight reduction through proper exercise, consuming healthy balanced diet and role of physical activity, so as to maintain proper body weight and to prevent future complications of obesity were advised to the students.

Declaration:

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Conflict of Interest: Nil

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Relevance of Project Evaluation and Review Technique (PERT) for Procurement of Equipments in a Government Medical College and Hospital in North-East India

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Abstract:

Introduction: Continuous procurement of various equipments in the hospitals is essential to keep up with global progress of healthcare services. In public sectors, procurement process largely depends on budget sanctions and also by a number of formal procedures and rules which leads to delayed procurement. With this prevalent scenario, the present study was carried out to evaluate the procurement of two major equipments in an apex tertiary care institute using Project Evaluation and Review Technique (PERT). **Objective:** This study was done to evaluate the procurement of two major equipments using PERT in a tertiary care institute. **Method:** This study was conducted using Operational Research technique in an apex tertiary care institute i.e., medical college and hospital, in one of the North Eastern states of India. All the procurements related to equipments in that teaching hospital initiated in the financial year 2021 were listed. Out of them, two procurement files were selected by simple random sampling; procurement of Operating Table and Bio Safety cabinet Level – III. Project Evaluation and Review Technique (PERT) was applied to calculate the possible reduction in time in the whole procurement process. **Results:** The present study showed that procurement of Operating table took 185 days where minimum 8 days could have been saved and procurement of Bio-Safety cabinet Level-III was completed by 702 days where minimum 196 days could have been saved. **Conclusion:** Application of PERT in this procurement evaluation process can play significant role by calculating critical path and predicting the possible delay.

Keywords: Medical equipment, Operational research, Operating table, Project Evaluation and Review Technique (PERT)

Introduction:

Healthcare across the globe has evolved tremendously. Along with advancement in knowledge, medical equipment technology has also evolved at an exponential pace to introduce fineness and accuracy in diagnosis and treatment. Changing healthcare policies have created a space for the medical equipment industry to showcase their products and promote them in the sector. To keep pace with this advancement, there is a continuous demand for up gradation of medical equipments in hospital settings. Procurement cycle in the public sector settings is governed by a number of formal procedures guided by a set of procurement rules which are often time consuming. Most hospitals have their unique system of collecting the demands and materializing them. In most public sector hospitals, it is the guided by an annual procurement plan which is

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prepared by the central store of the hospital, which in turn is prepared based on the user area demand. High end medical equipments however, may have some special procedures to follow depending on the hospital policy. In general, most hospitals have a separate procurement cell or section which deals with these procurements. High end machines or cost intensive equipments are not routinely purchased and hence when demanded by the user department, needs some scrutiny as well as sufficient justification. These demands when placed before the administrative heads undergo the routine formal procedures which include processes like selection of specification, estimation of budget, sanction of budget, etc. followed by tender formalities and award of contract.^[1] All these steps in procurement are unique and require their own time due to multiple stake holders in public procurement. Although, all these steps are essential, alternative paths can still reduce the required time. Hence, evaluation is quintessential for ensuring smooth procurement process. Application of Project Evaluation and Review Technique (PERT) in this process can play significant role.^[2,3]

Method:

The present study is a descriptive study carried out in the hospital setting of a tertiary care institute in one of the North-Eastern states of India. All the official data were retrieved with permission from the administrative authority. The study was carried out during the year 2022. For purpose of the present study, all procurements related to machinery and equipments initiated during the financial year 2020-2021 in the study setting were listed. A total of 18 files were in the process of procurement related to machinery and equipments of financial value worth Rs. 5,00,000/- and above. Some of the listed files were also not physically available in the concerned section on account of movement on the days of data collection. Out of the available files, two were selected by simple random sampling for the present study on account of short study period and convenience. The selected files were related to procurement of Operating Table and Bio Safety cabinet Level-III.

Role of PERT for Procurement of Equipments...

For this purpose, the steps of procurement process in general, were specified initially to compare with the standard.^[1]These steps are:

- 1. Initiation of the requisition.
- 2. Decision of the administration to procure.
- 3. Selection of specification of the item.
- 4. Obtaining administrative approval and expenditure from competent authority depending on the financial involvement.
- 5. Preparation of the NIT/ e tender/creation of GeM bid.
- 6. Floating of tender / GeM bid.
- 7. Ending of bid submission.
- 8. Placing in technical committee.
- 9. Placing in finance committee and selection of L1 bidder.
- 10. Placing before the appropriate purchase committee for finalization of rate and firm.
- 11. Approval from the next higher committee.
- 12. Placing of supply order.
- 13. Supply.
- 14. Installation and commissioning.

Application of PERT: The program (or project) evaluation and review technique, commonly abbreviated PERT, is a statistical as well as optimisation tool used in project management, is designed to analyze and represent the tasks involved in completing a given project.

The various steps employed in application of PERT to a project are:-

- Identification of specific activities and milestones.
- Determination of the proper sequence of activities.
- Construction of a network diagram.
- Estimation of time required for each activity.
- Determination of the critical path.
- Updating PERT chart as the project progresses.

		-		-	
Sr No	List of activities	OT table	Days	BSL III	Days
А	Date of Requisition	05-08-2021	_	26-05-2020	_
В	Decision to Purchase	07-08-2021	02	26-05-2020	0
С	Specification committee	23-08-2021	16	27-05-2020	01
D	Administrative approval	31-08-2021	08	09-12-2020	196
	expenditure sanction				
Е	Tender notification	27-10-2021	57	03-07-2021	206
F	Tender closing	17-11-2021	21	26-07-2021	23
G	Technical evaluation	26-11-2021	09	24-08-2021	29
Н	Financial bid evaluation	18-12-2021	22	07-01-2022	136
Ι	Purchase committee	17-01-2022	30	12-01-2022	05
J	Approval	20-01-2022	03	24-01-2022	12
К	Purchase order	25-01-2022	05	31-01-2022	07
L	Supply	05-02-2022	11	10-4-2022	69
М	Installation & commissioning	06-02-2022	01	28-4-2022	18

Table 1 : List of Activities and Their Duration for Procurement of Operating Table(OT table) and Bio Safety cabinet Level (BSL) III

Results:

Present study evaluated the Application of Project Evaluation and Review Technique (PERT) in procurement of equipments in tertiary care institute. List of activities and their duration for procurement of Operating Table (OT table) and Bio Safety cabinet Level (BSL) III is shown in Table 1.

Network chart related to procurement of OT table and BSL III is given in Figure 1 and Figure 2. For OT table procurement maximum time lag was found in the process of tender notification (57 days) followed by purchase committee (30 days) and for financial bid evaluation 22 days (Figure 1)

For procurement of BSL III, maximum time taken in for tender notification (206 days) and in administrative approval and fund sanctioning (196 days). (Figure 2)

Discussion:

The present study showed that completion of procurement of Operating Table has taken 185 days. But there was scope for reduction in time in few of the activities. If the requisition was put up along with the specification of item, 8 days time could have been saved. Administrative approval and fund sanction has taken 57 days and financial bid evaluation took 30 days which could have been reduced by proper planning. Procurement of Bio Safety cabinet Level III was completed by total 702 days. Again by placing the requisition along with specification of the item, 196 days could have been saved. Administrative approval and fund sanctioning took 206 days which is very long. The reason being, health infrastructure was suddenly hit by the COVID 19 pandemic. At that time, resources were diverted towards the pandemic management which led to this significant delay. Another two most time consuming steps were technical evaluation and purchasing the order where time reduction was possible.



Figure 1 : Network chart related to procurement of OT table*

Figure 2 : Network chart for procurement of Bio-Safety cabinet Level III*



Utilizing PERT, all the activities required for the purchase of equipment can be planned before hand there by reducing the time of completion of overall project. In a study conducted at Nizams Institute of Medical Sciences, considerable reduction in procurement time of an MRI machine was observed. A period of 23 weeks could be reduced.^[4] Woolf et al, applied PERT to a medical research project at the Hospital situated in Toronto. In order to use PERT, the project was broken down into the individual tasks and time estimates were given to each of these activities. Whenever each activity was completed, an International Business Machine (IBM) card was sent to the project director who compared the actual completion date with respect to the date on the schedule report. Application of PERT made it possible to determine whether the project was on time, behind or ahead of schedule and significantly helped to organize the project and maintain progress toward its conclusion.^[5]

In another study conducted in the emergency department of a tertiary care hospital to analyse the different types of process flow with respect to PERT technique, the critical path, completion time and any variation in path in the emergency care unit was estimated. The study contained an exploratory research with random sample of 100 patients within the sample of 460 in duration of 2 months. On application of PERT the expected time of project completion was 84.89 minutes whereas the variance time was found to be 253.1 minutes.^[6]

Limitation of the study:

Although, current study tried to identify the events where time could have been saved, a number of other facets of delay in these steps remained unexplored and this could be addressed by qualitative methods.

Conclusion:

Application of PERT in the planning stage of any procurement can reduce the overall time taken for the project. After completing the network diagram, progress of all the activities can be monitored easily and this will help in completing the project within the specified timeframe. The project also can be expedited by reducing the time taken for each activity in the critical path.

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Dilemmas and Perceptions regarding Medical Education in Hindi medium among Medical Community of Northern India: A Cross Sectional study

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Abstract:

Introduction: The medical curriculum, the medium of instruction and evaluation in India, is primarily English. While it has the advantage of preparing Indian medical graduates to represent and interact globally, it also translates into learning difficulties for a substantial population of Indian medical students. Hindi is the common language of communication among majority of the population in Uttar Pradesh.Madhya Pradesh Government in India has already started the option of pursuing the allopathic graduate medical course in Hindi. There is paucity of data regarding opinion of medical professionals about implementation of Medical Education in Hindi in Uttar Pradesh and nearby states. **Objective:** To assess the attitude and opinion of medical students and medical professionals towards using Hindi in Medical Education. Method: A crosssectional web-based online survey was conducted between 1st December 2022 and 31st January 2023. Undergraduate medical students, interns, residents and faculty from medical colleges, hospitals of Uttar Pradesh and neighbouring states (Uttarakhand and Bihar) were contacted to participate in this survey using pretested structured questionnaire. **Results:** A total of 1606 participants responded and answered the questionnaire and 1575 responses were found complete and used in analysis. Most participants (52.8%) believed that Medical Education in Hindi would attract more students from Hindi backgrounds to join the medical field. Similarly, 58.9% of participants were of the opinion that Medical Education in Hindi would improve communication with patients. However, about half of the participants (49.5%) perceived teaching in Hindi as a hurdle in acquiring higher education. Conclusion: More than half of the participants thought that medical education in Hindi will attract more students from Hindi backgrounds to join the medical field. Similarly, Medical Education in Hindi was perceived to improve communication skills with patients, at least where Hindi is a vernacular language by majority of the participants.

Keywords: Curriculum, Hindi, Language, Medical Education, Opinion, Policy

Introduction:

The medical education system in India is one of the largest in the world. ^[1]Although the vernacular language in India is not English, medical education is mainly imparted in English. The medical curriculum, the medium of instruction and evaluation in India, is primarily English. While it has the advantage of preparing Indian medical graduates to represent and interact globally, it also translates into learning difficulties for a substantial population of Indian medical students. Modern medical literature is not available in Hindi.

Moreover, the medical terminology in Hindi is limited. Nagari Pracharini Sabha(established on 16th July 1893, Kashi) published the first Hindi Scientific Glossary (HSG) in 1906. Since then, the same has

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hardly been updated. The HSG was intended to provide Hindi equivalents for English technical terms used in scientific communications.^[2] Some e-journals are also devoted to promoting Hindi in Medical Education (Medical Concepts in Hindi).^[3] Recommendations to improve medical education in India have been given by different scholars at regular intervals. Some have been put into practice. Madhya Pradesh Government in India has already started the option of pursuing the allopathic graduate medical course, MBBS, in Hindi. Those trained in the Indian vernacular language may find it challenging to interact abroad, but they may serve better in their native rural areas.^[4] Uttar Pradesh and neighbouring states Delhi, Bihar, Haryana, Himachal Pradesh, Uttarakhand, Madhya Pradesh, and Rajasthan constitute India's Hindi-speaking heartland. Hindi is the Lingua Franka (a shared language of communication) of this state.^[5] So, this study was planned to obtain the opinion of medical professionals about implementation of Medical Education in Hindi in Uttar Pradesh and nearby states.

Objectives:

To assess the attitude and opinion of medical students and medical professionals towards using Hindi in Medical Education

Method:

A cross-sectional web-based online survey was conducted using Google Form. The survey was conducted to collect responses between 1st December 2022 to 31st January 2023. Undergraduate medical students, interns, residents and faculty from medical colleges, hospitals of Uttar Pradesh and neighbouring states were contacted to participate in this survey. A pretested, structured questionnaire was designed by the authors after discussion and consultation with senior faculty of the department to fulfil the objective. The target population was approached via various social media platforms, including WhatsApp, e-mail, Facebook etc.

Results:

A total of 1606 participants responded and answered the questionnaire. Incomplete data found during data cleaning were excluded. One thousand five hundred seventy-five responses were found complete and used in further analysis.

Five hundred and seventy-one (36.3%) participants used the Hindi language to provide their responses. Majority (44.8%) of the participants were below 25 years of age. Male participants were 1065 (67.6%), whereas females were 510 (32.4%). Demographic variables are compiled in Table 1.

About one-third (35.5%) of participants felt that, entire medical curriculum wrapped in English language is challenging for majority of students to understand. When asked about the impact of providing medical education in the Hindi language, 616 (39.1%) participants agreed that it would help students further. Most participants (52.8%) believed that Medical Education in Hindi would attract more students from Hindi backgrounds to join the medical field. Similarly, 58.9% of participants were of the opinion that Medical Education in Hindi would improve communication with patient. However, about half of the participants (49.5%) perceived teaching in Hindi as a hurdle in acquiring higher education.(Table 2)

Participants also opined about initiating medical literature in Hindi. (Table 3) Two-thirds of participants (66.7%) thought that keeping medical terms in English, but the explanation in Hindi will be a more reasonable method of introducing medical literature in Hindi. Most participants (58.8%) also felt that the Government should introduce medical education in Hindi in all medical colleges but as a parallel system.

When asked about ways of incorporating Hindi into Medical Education (Multiple options were possible), 421 participants (26.7%) opined that medical books in Hindi would help incorporate Hindi in to the medical curriculum. Most participants (64.4%) favoured Class/ Ward teachings in Hindi as part of the inclusion of Hindi in to the medical curriculum. While 60.1% participants favoured granting permission to answer theory and practical examinations in Hindi.

Table 1 : Socio-Demographic Characteristics of Participants (N=1575)				
Var	Number (%)			
The language chosen by the	Hindi	571 (36.3)		
responders for the response	English	1004 (63.7)		
Age group (Year)	<25	706 (44.8)		
	25-30	178 (11.3)		
	31-40	150 (9.5)		
	>40	541 (34.4)		
Gender	Male	1065 (67.6)		
	Female	510 (32.4)		
Medium of schooling	Completely English	582 (37)		
	Mixed English and Hindi	769 (48.8)		
	Completely Hindi	224 (14.2)		
Current role in the medical field	MBBS student/Intern	842 (53.5)		
	Junior/Senior Resident	97 (6.2)		
	Faculty	216 (13.7)		
	PHMS (Provincial Medical	115 (7.3)		
	and Health Services)			
	Private practitioner	305 (19.4)		

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Table 2 : Perception of Participants about the Use of Hindi in Medical Education (N=1575)

Questions		Number (%)		
		Yes	No	Can't say
1	Medical curriculum in total English	374 (23.7)	559 (35.5)	642 (40.8)
	makes it difficult to understand for most students			
2	If medical education is taught in Hindi,	616 (39.1)	530 (33.7)	429 (27.2)
	it will help students further			
3	Medical Education in Hindi will attract	832 (52.8)	426 (27)	317 (20.1)
	more students from Hindi background			
	to join the medical field			
4	Medical Education in Hindi will improve	927 (58.9)	376 (23.9)	272 (17.3)
	communication with patients			
5	Medical Education in Hindi will become	779 (49.5)	416 (26.4)	380 (24.1)
	a hurdle in higher studies			

	Opinion of participants	Number (%)
How should medical	It should be in pure Hindi	25 (1.6)
books be written in Hindi?	Medical terms are in English, but	1051 (66.7)
	the explanation be given in Hindi	
	Without any change, it should be left in English itself	499 (31.7)
How should the	From now on, in all medical colleges	142 (9.0)
Government introduce	From now on, in some limited medical colleges	257 (16.3)
Medical Education in Hindi	In all medical colleges, but as a parallel system	926 (58.8)
	It should be started after a few years	250 (15.9)

Table 3 : Opinion of Participants about Ways of Introducing Medical Literature in Hindi and its Inclusion in the Medical Curriculum (N=1575)

Discussion:

English has been the official international language for globally sharing technical, academic and scientific information.^[6] The field of medicine is not an exception. However, some countries favoured teaching medicine in their vernacular language.^[7] Many students in India complete schooling in their local language. On entering medical school, they get exposed to an entirely new curriculum in a different language - English. This sudden change in the language of instruction sometimes makes it difficult to grasp the intricacies of medical subjects, especially for those with little exposure to English, resulting in poor understanding and comprehension of basic medical concepts. Moreover, during patient interaction in medical wards, many such students find it difficult to correlate and convey their theoretical and clinical knowledge.^[8]

In the present study, only 35.5% (559) participants did not find the medical curriculum in complete English challenging to understand. However, in their study, Gupta MM et al. found that the majority (69.8%) of the first-year MBBS students did not find English as a medium of instruction challenging. In their study, Gupta MM et al. concluded that English as a medium of instruction should be

retained for medical education.^[9] More than threequarters of participants in our study believed that Medical Education in Hindi would improve patient communication skills. Similarly, 1051 (66.7%) participants in this study opined to keep medical terms in English but with explanations in Hindi. It may have a crucial impact, at least in places where the vernacular language is Hindi. Because better communication with patients will help better understand patients' complaints and the disease.^[10] There is definite shortage of doctors at government health care centres in rural areas as compared to urban areas. There are 13.3 allopathic doctors in urban areas whereas only 3.9 are available in rural areas on 10,000 population.^[11] Medical education in Hindi may also help produce more rural physicians, resulting in filling the Urban-Rural health care need gap.^[12] Though 49.5% of participants perceive that Medical Education in Hindi will become a hurdle in higher studies, grasping basic Medical Education in mixed language or Hinglish will better prepare the students to take up the challenges of advanced medical studies. The same has been the case in several other nations like China, Germany, Spain and others where the primary medical education has been in their native language.

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The Government of India is continuously trying to align medical services to its diverse population. The new competency-based curriculum for medical graduates represents a paradigm shift. It aims to produce "Indian Medical Graduates" with requisite knowledge, skills, attitudes, values, and responsiveness so that they may function appropriately and effectively as physicians of first contact in the community.^[13] In an attempt to prepare and serve more effectively Government of Madhya Pradesh has become the first state in the country to start the MBBS (Bachelor of Medicine and Bachelor of Surgery)course in Hindi. The pilot project of the MBBS course in Hindi has started at Gandhi Medical College in Bhopal.^[14] Uttarakhand Government has also announced to launch MBBS course in Hindi soon.^[15] The Madhya Pradesh Directorate of Medical Education has developed Hindi textbooks for subjects taught to first-year anatomy, biochemistry, and physiology students. Both Hindi and English are planned to be used in classroom lectures, and students can choose to write their exams in either language in line with the findings of this study wherein 946 (60.1%) participants seek permission to answer theory and practical examinations in Hindi.

Since 2017, the National Eligibility cum Entrance Test for medical courses has been done in Hindi and other Indian languages. The new education policy introduced in 2020 emphasised imparting technical education in the mother tongue. In its October 2022 report, the Parliamentary Committee on Official Language recommended Hindi as the language of instruction in higher education in Hindispeaking states.^[4]

The Medical Council of India (MCI) examined the matter of imparting medical education in the Hindi language in 2018 and provided feedback regarding the issue. One of the biggest attractions to imparting medical education in English in India is the easy availability of medical literature in English. It also opens the floodgates of international avenues for higher studies, emigration and employment, as many developed world countries have English as a medium of instruction for medical education. Students perceive that instruction in English helps them stay updated with international standards. Therefore, in the national medical entrance examination (NEET), which is conducted in Hindi, English, and many regional languages, the candidates mostly opt for English. As per the NEET 2018, about 10,60,923 candidates registered for English and 1,46,542 for Hindi.^[16] The Government initiative has also attracted some concerns from doctors. President of the Federation of All India Medical Association, which represents medical students and resident doctors across the country, said, "It is a retrograde step that will jeopardise the careers of young medics and hit the quality of health care. Graduates trained in native languages will find it difficult to apply for international fellowships or appear for foreign licensing exams, and within India, they may be least preferred for jobs". Communicating the results to policymakers is crucial to benefit the community.^[17]

Conclusion:

More than half of the participants thought that medical education in Hindi will attract more students from Hindi backgrounds to join the medical field.Similarly, Medical Education in Hindi was perceived to improve communication skills with patients, at least where Hindi is a vernacular language by majority of the participants. It may also promote competency-based Medical Education (CBME). Class/ Ward teaching in Hindi will help use of Hindi in Medical Education. Half of the participants thought that medical education in Hindi will become hurdle in higher studies. Rather than an abrupt change, Hindi can be included as a parallel language for easy acceptability and success. It will not only generate a feeling of nationalism but ultimately help to fulfil the goal of providing higher Universal Health Coverage to its Hindi-speaking population.

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Recommendations:

Medical terminologies in English along with discussion and teaching in Hindi may be adopted to impart Medical Education. This may be helpful to understand and practice of medical knowledge among medical community in a better way. It may improve the quality of primary health care.

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Declaration:

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Conflict of Interest: Nil

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Medical Education in Hindi medium...

Knowledge and Practice of Breast Self-Examination among Females attending a Breast Cancer Screening Camp

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What problem was addressed?

Breast Cancer (BC) is the most commonly detected cancer among women in the large mainstream (140 of 184) of countries worldwide.^[1] A recent study of breast cancer risk in India revealed that one in 28 women develop breast cancer during their lifetime. This is higher in urban areas, where one in 22 women develops breast cancer in a lifetime as compared to rural areas where this risk is relatively much lower at one in 60. [2] Breast selfexamination (BSE) is a useful screening tool to empower women and raise awareness about their breast tissues and help detect any breast abnormalities when they occur. On a very special occasion of Mother's Day,a non- profit marketing organization (trust) conducted BC screening camps at more than 110 different hospitals across the district studied. The objectives were; early detection of breast cancer sign/and symptoms through primary check-up and; to create awareness in women about BSE. The hospital where the study was conducted got an opportunity to be involved in this mass screening program.

What was tried?

A cross-sectional study was conducted to assess the level of knowledge regarding BC and practice of BSE among women aged between 16 and 70 years attending the camp. To assess the Knowledge, Attitude and Practice a questionnaire was prepared to interview the participants that included; demographic profile, 8 questions to assess

knowledge and 9 questions for attitude & practice. From the tertiary care government hospital where the study was conducted a total 82 Doctors and Interns got involved in this noble work. They were recruited over 110 different centers across the city. All of them were given training for half a day by a Gynecologist on; Breast cancer signs, symptoms, risk factors, protective factors, Breast self-examination and treatment options available for breast cancer. Confidentiality of their information and willingness to participate was ensured after taking informed verbal consent Statistical Package for Social Science (SPSS) program, version 24, was used to analyze the data. Knowledge score was calculated by recoding of the knowledge questions by giving one point to the correct answer and zero to the incorrect answer. Then, the points were summed and multiplied by 100 over the number of questions.

What lessons were learnt/Reflections?

Knowledge:

A total of 104 participants gave consent and were finally interviewed. A total of average score of knowledge was 27.6%. The study revealed poor general knowledge of the participants regarding BC. Among the domains in knowledge the participants' scores were; early diagnosis improves outcome=54.8%, common cancers in women=42%, age group in which BCs are common=32.6%, frequency of occurrence=29%, sign/symptoms of cancer=22.8%, treatment availability for cancer=20%, common causes of BC=10.7% and protective factors of cancer=07.6%.

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Attitude and Practice:

Around 37/104 (35.5%) of the participants were aware of Breast Self Examination. Out of the 37 participants who were aware the sources of information were; doctors in 48%, relative/ neighbour in 27%, 5% each television and health worker, news paper in 25% and 10 % as others. Females practicing Breast Self Examination were 24/104 (23%). Out of the 24 practicing SBE; frequency of SBE was once daily in 8%, once in a week in 16%, once in a month in 29%, once in 2 months in 12.5% and once or twice a year in 33.3% respectively.Some of the reasons for not practicing BSE(n=80) were; 64.5% did not know/ unaware, 67%said that because they were not having breast problem, 18.7%, don't think that there was a need.

Conclusion:

The study revealed poor general knowledge and attitude of the participants regarding BC and BSE. Out of those practicing BSE (24) only few were ideally practicing it. The major reasons for not practicing Breast Self Examination were not having any breast problem and unawareness.

What next?

The study findings indicate the importance of applying a training program to increase the level of awareness about BC and practicing BSE that comes within the local and international efforts fighting against this dangerous disease. Campaign programmes should be organized to create awareness; Breast self-examination monthly should be started in the 20's and above, Clinical breast exams every 3 years should be started in the 20's and aboveand Mammographic screening annually should be started at the age of 40 years. Regular practicing of BSE will be increased among those at risk if they are taught and informed about the steps of practicing BSE.

Declaration:

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Conflict of Interest: Nil

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Citation: Several research studies have revealed gap between facts and beliefs of adolescent girls and showed that there is low level of awareness about menstruation among girls when they first experience it.^[4]

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Obituary



Dr. SHOBHA MISRA DOB : 02-02-1963 DOD : 26-01-2023 Dr. Shobha Misra, working as the Professor and Head in the department of Community Medicine at P D U Medical College, Rajkot, left us for her heavenly abode on the 26th of January 2023. Always a lifelong learner, she was a voracious reader and an epitome of the role of an Indian Medical Graduate. Having passed her post-graduation from Medical College Baroda in 1995, she went on to achieve a plethora of other academic qualifications: she held degrees in Naturopathy and Yoga, Hospital Administration, Maternal and Child Health, Human Resource Management and Medical Education. She completed the Graduate Certificate in Clinical Investigations online course from University of South Florida in 2009, was a FAIMER fellow from Philadelphia(2018), recipient of the Advanced Course in Medical Education Technology(2015), Postgraduate Certification in Health Professions Education Accreditation and Assessment from the University of Keeke, United

Kingdom(2018) and had been honoured with F-IAPSM (2017). She also got PEARL award for excellence in Medical Education during SMART SUMMIT-2017. She had received a Certificate of Honour from the Research Culture Society International Award for Excellence in Research in 2021. The recent feather in her cap was her YouTube channel "Dr. Misra's PSM PG Hub", through which she aimed to provide quality teaching to the PG students via a platform that could be accessed by all.

She had a teaching experience of 30 years. She was actively involved in teaching and training health professionals regarding research and community related activities. As a researcher she had over 50 publications in various National and International journals. She developed a curriculum for Rural Orientation of Medical Students at Rural Health Training Center of College, where she innovated and implemented a number of community activities along with the villagers to improve the health of rural and slum dwellers. She played a major role in designing integrated learning modules and health awareness videos for IAPSM econnect series 'People's health it matters'.

Dr Shobha was an incredible human being, an excellent teacher and a true mentor, who always motivated me to give my best. She always made her classroom brighter with her knowledge and wisdom and an ever ready smile. She as the one who always put an effort to make teaching and learning student friendly, by engaging students as equal partners in their learning.

It is indeed a great loss to her entire family – she being survived by her daughter and husband, and of course to our community medicine fraternity. Her premature and sudden demise has saddened my heart beyond words and left a void which cannot be filled. All the lessons she taught will be with me always. I hope she is in a good place and is watching and blessing us with her love and care. Everyone is going to miss her presence. I am deeply saddened to have had to write this obituary, which I never thought I would have to write.

Death cannot take away a person. A person goes, memories live on.......You will always remain alive in our hearts Dr Shobha. All our heartfelt condolences are with your loving family.

Om Shanti....

Dr Sangita V Patel and all Community Medicine Family PDU Medical College Rajkot and Baroda Medical College

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