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A Situational Analysis on Health System Strengthening by Using Smart Phone for E-Referrals at Tertiary Health Care Centre in Aspirational Tribal District-Dahod, Gujarat

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ABSTRACT

Referral is a process in which a health worker at one level of the health system, having insufficient resources (drugs, equipment, skills) to manage a clinical condition, seeks the help of a better or differently resourced facility at the same or higher level to assist in. A definition by WHO. In an era of electronic world, everything is going paperless while the most widely used electronic device is cell phone. This give rise to newer method of referrals can be called as e-referrals. To evaluate the frequency and reasons of references at tertiary health care center (trend analysis). To compare the frequency of referrals before and after using the e-referral system by different primary health centers. To identify the Primary Health Center's from where the referrals are being done. A secondary data based research of referral from obstetrics and gynaecology department at tertiary care hospital in Dahod. The referring centres are PHC, CHC, SDH or Sub-centre. To ease referral the intervention of Whatsapp group was done on 9th May, 2022 connecting tertiary care hospital with the other centres. Thus the referral done recorded before and after the intervention has been analysed. The frequency of the referrals is higher in 2022 as compared to 2021 showing the increasing trend of the referral. Highest referral was done for severe anaemia being 14.5%. There is significant rise in cases post intervention of e-referral through Whatsapp group. 49.18% of the patients were referred from the Community Health Centres. Highest number of patients were referred from the centre within the 50 km of distance. The referral to tertiary care hospitals are following the increasing trend. Severe Anaemia is the most common cause of referral in the Dahod district. E-referral increases the frequency of referral.

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Key Words
E-referral, smart phones, tertiary hospitals

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INTRODUCTION

Referral is a process in which a health worker at one level of the health system, having insufficient resources (drugs, equipment, skills) to manage a clinical condition, seeks the help of a better or differently resourced facility at the same or higher level to assist in. A definition by WHO. The referral system in India follows the pattern of three tier system which is inter-related to each other. The patients are referred to the higher centre for better management, timely from the rural health care systems to tertiary health care facility[1].

In an era of electronic world, everything is going paperless while the most widely used electronic device is cell phone today. This has given rise to newer method of referral known as e-referrals[2]. Due to failure of conventional paper-based referral systems in our country, we can introduce an e-referral system in the era of internet. It is evident, that this artificial intelligence enabled e-referral system has many advantages over the traditional paper-based referral system. It has aided health workers for timely management of cases. Most importantly, it has streamlined the existing unorganized referral process[3].

For effective e-Referral system, there should be a collaborative platform where easy search and discovery for health care providers is possible and helpful in decision making[4]. Whatsapp being one of the most common interface used by every common man fits in this criteria. This can connect multiple people at this platform and exchange of information in same time is possible. One such initiative was taken by ZMCH, a tertiary care facility in aspirational tribal district- Dahod, Gujarat where the Whatsapp was used to connect the doctors from the referring end to the doctor at the tertiary end in referral related Whatsapp group. There was timely sharing of the details of the patient being referred and this helped the doctors at receiving end to prepare about it.

Aims and objectives:

- To evaluate the frequency and reasons of references at tertiary health care center (trend analysis)
- To compare the frequency of referrals before and after using the e-referral system by different primary health centers
- To identify the Primary Health Center's from where the referrals are being done

MATERIALS AND METHODS

Zydus Medical College and Hospitals (ZMCH), Dahod is the only district and tertiary care hospital in the Dahod district. There are 140 PHCs, 11 CHCs, many Sub-centers, 7 sub-district hospitals who seek ZMCH as centre of excellence for patients who are unable to get the required management at the primary health care level. The most common and frequent emergencies were recorded from Obstetrics and Gynaecology department related to maternal care. Thus the patient data from the Obstetrics and Gynaecology department has been analysed.

This study was conducted to know the situation of referral in the tribal district of Dahod for which a secondary data based research was done. The PHCs or centre below the rank of tertiary care are connected through Whatsapp group with ZMCH, which was brought in action from 9th May, 2022. Before this intervention there was no common platform to link the two centres. Thus, the referral details were shared beforehand to ZMCH through this group. All the referral done from January 2021 till may 2023 are taken into analysis. All patients referred from PHCs or any centre below the rank of tertiary care were included in the study. This study was done in 6 months from protocol writing to final report writing.

Statistical analysis method and tool/software: MS Excel was used to calculate frequency and percentages. The comparison of two means (Z test) was done to know the difference in frequency of referral before and after intervention of Whatsapp group for which $p<0.05$ is considered significant.

Ethical consideration: No harm to the patients was done as it was a data based research. Permissions were taken from IEC (Institutional Ethics Committee). Data analysed have no names disclosed in research paper.

RESULTS

The referral data of 2186 patients are received from the secondary source of data (Hospital records) from January 2021 till may 2023. Referrals were done in the obstetrics and gynecology department through various PHC, CHC, SDH and Subcentres. The tables below, gives the age distribution of the patients.

The age distribution of the patients as given in the Table 1, 67.15% belongs to the age group of 15-25 years and 30% belongs to the age group of 25-35 years. These are the mean age group of reproductive woman.

Table 1: Age Distribution of the patients

Age (years)	No.	Percentage
5-15	7	0.32
15-25	1468	67.15
25-35	656	30.01
35-45	51	2.33
45-55	3	0.14
55-65	1	0.05
Total	2186	100.00

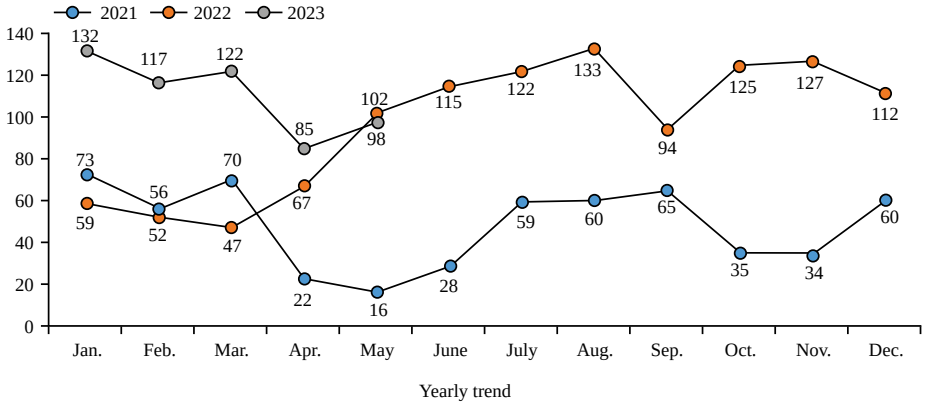

Fig. 1: Month wise distribution of the frequency of the patients in each year

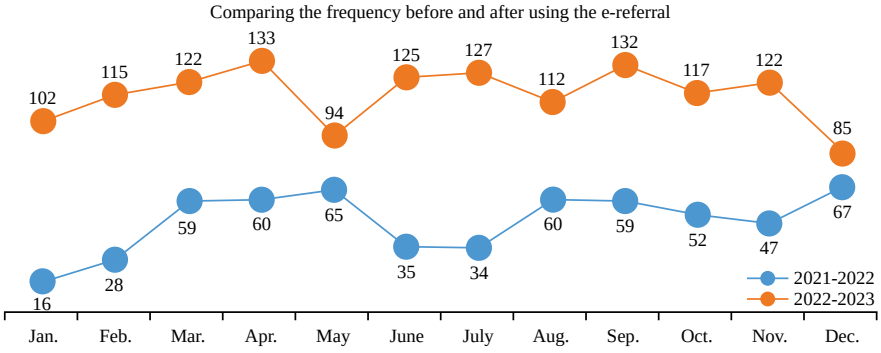

Fig. 2: The frequency of referrals before and after using the e-referral system by different primary health centers (n = 1884)

As shown in the Fig. 1 the frequency of the referrals is higher in 2022 as compared to 2021 showing the increasing trend of the referral at the tertiary care Centre. The referral in 2023 till May shows the initial increasing then a decreasing trend.

The given Table 2 shows the most common reasons of referral at the tertiary health care centre. Highest referral was done for severe anaemia being 14.5% (317). >100 patients were referred for the reasons like previous caesarean section, multiparty, non normal presentation, high risk primi, prolong labour and post-partum haemorrhage. 5.63% (123) patients were transferred from primary health care facilities only for the delivery of the baby as there was no facilities available for delivery.

The Fig. 2 shows the comparison of the frequency of the referrals after putting the e-referral system in place through WhatsApp group. There is significant rise in cases post intervention.

The Table 3, shows the comparison of the frequency of the patients before and after using the e-referral system. There were 582 total referrals before the e-referral platform which increased to 1386 patients. The $p<0.0001$ shows significant difference in the referrals in both the years.

Table 2: Reasons of referring the patients from the primary health care facilities (most common)

Reasons of referral	No.	Percentage
Severe anaemia	317	14.50
Other reason	256	11.71
Previous caesarean section	134	6.13
Delivery of baby	123	5.63
Multiparity	122	5.58
Non normal presentation	122	5.58
High risk primi	117	5.35
Prolong labour	117	5.35
Post-partum haemorrhage	112	5.12
No progress in labour	90	4.12
Ante-partum haemorrhage	87	3.98
Hypertension	76	3.48
Premature rupture of membrane	71	3.25
Cephalo-pelvic disproportion	69	3.16
Foetal distress	48	2.20
PNC complication	48	2.20
Membrane leaking	42	1.92
Pregnancy induced hypertension	41	1.88
Sickle positive	41	1.88
Eclampsia	34	1.56
Pre-term labour	31	1.42
Retained placenta	30	1.37
Oligohydramnios	29	1.33
Placenta previa	29	1.33

49.18% of the patients were referred from the Community Health Centres while only 17.57% patients were refereed from the Primary Health Centres. 15% were referred from sub district hospitals an 14% from other state (Madhya Pradesh). <5% were referred from sub centre, private clinics, other states, U-PHC (Fig. 3).

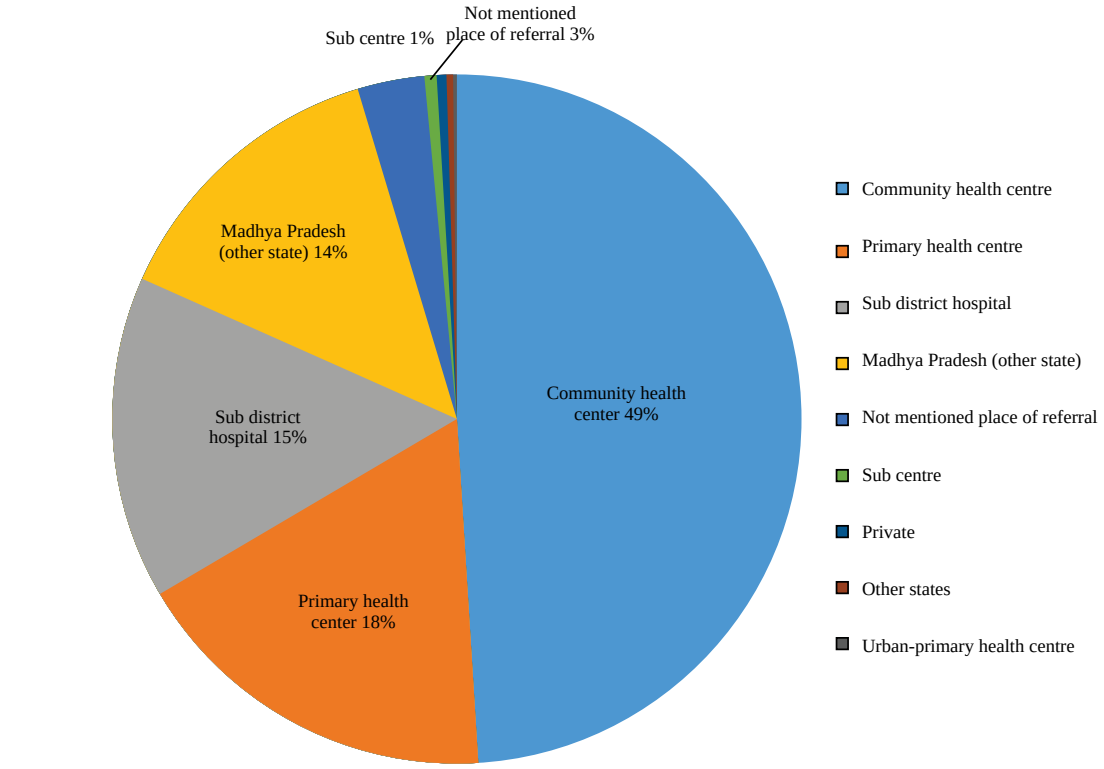

Fig. 3: Centres from where the patients are transferred (n = 2186)

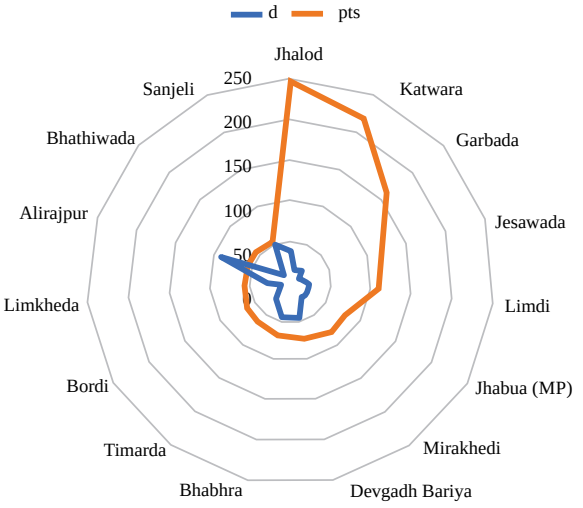

Fig. 4: Comparison of frequency of referrals vs the distance of the centre referring

d: Distance of the centre from ZMCH, Dahod and pts: Number of patients being referred from the same centre

>50 patients were referred from the centres mentioned above in the Fig. 4. The graph shows the distance of the centre from tertiary health care centre vs the frequency of the patient load. Highest number of patients were referred from the centre within the 50 km of distance. Jhalod, Katwara, and Garbada are among the highest in sending the referrals.

Table 3: Comparing the frequency before and after using the e-referral

	2021-2022	2022-2023	p-value
Average monthly referral	48.5	115.5	<0.0001
Standard deviation	16.46	15	
Range	51	48	
Minimum patients referred	16	85	
Maximum patients referred	67	133	
Total referred patients	582	1386	
Total months	12	12	
Confidence level (95.0%)	10.46301	9.53054531	

*Comparison of 2 means (Z-test)

DISCUSSIONS

In the given study, the data from the obstetrics and gynaecology department of tertiary care centre has been taken where the referrals from different centres have been done.

67.15% belongs to the age group of 15-25 years and 30% belongs to the age group of 25-35 years. These are the mean age group of reproductive woman[5]. Most of these women were referred for the Obstetric causes and very few for gynecological problems.

The frequency of the referrals was higher in 2022 as compared to 2021 showing the increasing trend of the referral at the tertiary care Centre. The referral in 2023 till May shows the initial increasing then a decreasing trend. There can be monthly variations to the trends and introduction of the e-referrals has also played a role.

Highest referral was done for severe anaemia being 14.5% (317). Kilaru *et al*.[6] also found in their study the cause of referral being anaemia to be 10.7%.

More number of patients were referred for the reasons like Previous Caesarean Section, Multiparty, Non Normal Presentation, High Risk Primi, Prolong Labour and Post-Partum Haemorrhage. 5.63% (123) patients were transferred from primary health care facilities only for the delivery of the baby as there was no facilities available for delivery.

On comparing the frequency of the patients before and after using the e-referral system, 582 total referrals before the e-referral platform which increased to 1386 patients. The $p<0.0001$ shows significant difference in the referrals in both the years. E-referrals gives the referring doctor a platform to inform the patient to the doctor at the receiving end. Later with the information being shared the doctor at receiving end is prepared to manage before the patient arrives. This has significantly increased the referrals. Similar innovations were shared by Gupta *et al*.[2] regarding the tele-calling which have helped in better and faster referral of patients in the emergency.

49.18% of the patients were referred from the Community Health Centres while only 17.57% patients were refereed from the Primary Health Centres. 15% were referred from sub district hospitals an 14% from other state (Madhya Pradesh). <5% were referred from sub centre, private clinics, other states, U-PHC. More than 50 patients were referred from the centres who are in the 50 km radius of the ZMCH.

CONCLUSION

The referral to tertiary care hospitals are following the increasing trend. Severe Anaemia is the most common cause of referral in the Dahod district. E-referral increases the frequency of referral.

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