

CHALLENGES IN IMPLEMENTING DIGITAL HEALTH SERVICES IN RURAL INDIA

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Abstract

Introduction: The COVID-19 pandemic, with mandatory social distancing and lockdown, has shown the success of telemedicine in reducing geographical and time obstacles. This has stimulated its ingress into mainstream healthcare services as the safest means of interaction between doctor and patient during the pandemic. There are several barriers that need to be addressed in order to spread these digital services. **Aim:** This study explores the challenges to adopting telemedicine and its status in remote districts of Himachal Pradesh, India. **Methods:** A mixed-method approach was used to identify challenges found in remote healthcare facilities. A survey was conducted using a 20-item checklist to capture information regarding infrastructure, telemedicine equipment, manpower and demography of the area. During telephone interviews, questionnaires were used to evaluate the status of acceptance of telemedicine and challenges to its implementation in the remote State of Himachal Pradesh, India. **Results:** The study identifies the challenges as lack of awareness (75.9%), level of education of patient (44.8%) having primary education, age of the patient (17.2%), technically challenged staff (30%), followed by resistance to change (80%) and high workload with manpower shortage (60%). **Conclusion:** While there are other barriers, this study provides policymakers with insights into the current perceived challenges to telemedicine implementation, which they can address to increase the penetration of telehealth services, particularly in rural areas.

Keywords: digital health; rural; telemedicine; challenges; COVID-19; India

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Introduction

India has a diverse geography comprising high Himalayan mountains, deserts, extensive plateaus, and wide plains, with a population of more than 1.38 billion. Approximately 65% of the population live in rural areas.¹ Most are economically debilitated and geographically and politically marginalised. The Indian rural health care system is a three-tier system comprising sub-centres, primary health centres and community health centres.² Lack of awareness, limited access, shortages of manpower, low affordability and poor accountability are the major hurdles to healthcare delivery in rural India.³

To increase accessibility, availability and affordability of primary, secondary and tertiary healthcare services, the Ayushman Bharat Programme (PM-JAY) was launched in India in 2018. It has two components: Health and Wellness Centres, and the National Health Protection Scheme. The Health and Wellness Centres were expected to deliver a comprehensive primary health care package. Telemedicine was one of the components for the delivery of this service.

The vision of PM-JAY is to achieve Sustainable Development Goal 3.8, ensuring financial protection against catastrophic health expenditure and access to affordable and quality healthcare for all.⁴

As a part of the Government's commitment to sustainable development goals and to ensure inclusive growth, NITI Aayog (a Government public policy think tank) launched the Aspirational District Programme with an aim of transforming underdeveloped districts across the country quickly and effectively. The programme focuses on five main themes which have a direct bearing on the quality of life and economic productivity of citizens: health and nutrition; education; agriculture and water resources; financial inclusion and skills development; and basic infrastructure.⁵

The National Health Policy envisaged the creation of a digital technology health system in India. As a result, the National Digital Health Mission was launched by the National Health Authority. It is a complete digital ecosystem comprising four key features: health ID, personal health records, Digi-Doctor and a health facility registry.⁶ In order to create an online platform enabling interoperability within

the digital ecosystem, the Ayushman Bharat Digital Mission was introduced in 2021 to connect the digital health solutions of hospitals across the country with each other. It had four key components: health ID, health records, healthcare facilities and professionals' registry.⁴

The restrictions imposed during the COVID-19 pandemic caused a higher rate of unemployment in the rural population, resulting in economic devastation. Decreased mobility hampered access to primary healthcare facilities in remote areas. Until the advent of COVID-19, the growth of telemedicine had been slow. Social distancing norms and the country-wide lockdown accelerated its popularity and accessibility. The Ministry of Health and Family Welfare, along with NITI Aayog issued the first practice guidelines for telemedicine in India.⁷

The two major telemedicine interfaces used were eSanjeevani and Piramal Swasthya. The Government of India introduced its telemedicine service, eSanjeevani, as part of its 'Digital India' initiative on 9 August, 2020. During the COVID-19 pandemic, physicians have used videoconferencing to diagnose and treat patients in geographically diverse locations. This digital platform currently permits two types of telemedicine services, Doctor to Doctor (eSanjeevani) and Patient-to-Doctor (eSanjeevani OPD).⁸ These services are part of the larger government initiative to connect larger hospitals to smaller health centres in remote areas. Piramal Swasthya is an initiative under the Piramal Foundation that endeavours to make primary health care available and accessible to vulnerable populations.⁹

Although a number of telemedicine initiatives have been launched within India, its adoption as a means of mainstream healthcare provision has been slow. Technology barriers and lack of computer literacy have remained major hurdles to implementing telemedicine globally.¹⁰ The challenges of implementing telemedicine in India at the policy level, resources level and at the socio-culture level have been evaluated.¹¹ Perceived risk was conceived as another barrier to telemedicine adoption.^{12,13} In this study, we focused on the challenges faced by remote healthcare centres with pre-existing telemedicine services. The objective was to evaluate the current scenario and challenges faced by the telemedicine facilities in remote villages of Northern India. Additional objectives were to find out the primary pitfalls to the accessibility of telemedicine and to find a resolution as there was a lack of documented evidence.

Methods

The State of Himachal Pradesh is divided into districts, subdivisions, blocks and tehsils (local administrative divisions) of healthcare institutions. Kihar and Tissa of the district Chamba are two of the remotest blocks of the State. A field survey was conducted in 12 healthcare facilities in Kihar and Tissa, where telemedicine had already been set up. A 20-item survey checklist was developed to gather infor-

mation from the respective Block medical officers of Kihar and Tissa regarding the infrastructure, telemedicine equipment, manpower of the healthcare facilities that were equipped with telemedicine, and the demography of the area these facilities were catering to.

In order to explore the challenges faced by the healthcare providers and patients, we conducted a telephonic survey of healthcare providers and patients using open-ended questionnaires with five questions to explore the challenges they faced. Surveys were conducted at the convenience of the participants after explaining the purpose of the survey, and verbal consent was taken. Each telephone call lasted for 10-15 minutes. Validation of participant's responses was ensured by reading back the summary at the end of the survey. The participants from the 12 participating healthcare facilities included in the survey were enrolled using simple random sampling. The simple random number generator available in SPSS v23.0 was employed for randomisation. The survey data were analysed, and non-thematic, direct inferences were drawn. Most of the data gathered in this study pertained to telemedicine infrastructure, equipment and logistics available at the participating facilities. Furthermore, all the data gathered from the healthcare provider and patient telephone surveys were de-identified and anonymised before further analysis. Hence, no ethical clearance was sought for this study.

Results

The field survey of facilities revealed that the majority of the health facilities are equipped with one or other type of telemedicine setup like eSanjeevani and Piramal Swasthya (under NHM). (Table 1) Examples of telemedicine facilities are shown in figure 1.



Figure 1: Telemedicine set up in healthcare facilities.

Table 1. Survey results for infrastructure, telemedicine equipment, manpower of health facilities providing telemedicine.

	PHC Sundla	CHC Salooni	CH Kihar	SC Pringul	PHC Diur	SC Khandhwara	PHC Tungala	PHC Nakrot	CH Tissa	PHC Bunderi	SC Ganed	PHC Jajakothe
1. What is the existing /available telemedicine set up												
Computer	√	√	√	√	√	√	√	×	√	√	√	√
Printer	√	√	√	×	√	×	√	×	√	×	√	√
Uninterruptible power supply device	×	×	√	×	×	×	√	×	×	×	×	×
Separate Net connections (service provider) for service	×	√	√	×	√	×	√	×	√	×	√	×
Software (private/public)	×	Private	Private	×	Public	Public	Public	×	Public/private	Public	Private	Public
Electricity supply	√	√	√	×	×	×	√	×	×	×	√	×
Space provided (sq ft)	80	60	120	80	100	60	100	In a shed	80	80	60	60
2. Service utilisation												
Population served by health facility	8000	12000	18000	3000	12000	3000	8000	3000	18000	5500	1500	8700
Villages served	20	30	35	8	17	10	15	10	21	8	10	12
Daily OPD facility (patients/day)	50	100	150	0	20	3-4	20	20	100	6-10	3	10
Distance from district HQ (km)	30	50	72	85	72	75	100	60	70	85	80	88
Approach/transportation/ road to the facility	√	√	√	×	√	×	√	√	√	√	×	√
Average daily teleconsultations done (last 3 months)	1-2	3-4	3-5	×	×	×	1-2	×	2	×	2	×
Any community telemedicine engagement programme (IEC) in last 3 months	×	×	√	×	×	×	×	×	×	×	×	×
3. Staff engaged at telemedicine centre												
Dedicated telemedicine staff	×	√	√	×	×	×	×	×	√	×	√	×
Qualification	×	GNM	GNM	×	×	×	×	×	GNM	×	GNM	×
Teleconsultation experience (years)	×	5	5	×	×	×	×	×	4	×	4	×
Formally trained or not	×	√	√	×	×	×	×	×	√	×	√	×
4. Miscellaneous												
Availability of diagnostics support	√	√	√	×	×	×	×	×	√	×	×	×
Availability of medicine and other support	√	√	√	×	√	√	√	×	√	×	×	√
Capability of handling a medical emergency	×	√	√	×	×	×	×	×	√	×	×	×
CH: civil hospital; CHC: community health centre; GNM: general nursing and midwifery; HQ: headquarters; IEC: information, education and communication; OPD: outpatient department; PHC: primary health centre; SC: sub-centre.												

Most of the facilities with the Piramal Swasthya set up were manned by trained personnel. However, none of the facilities with the eSanjeevani platform were manned by Community Health Officers (CHOs). The facilities with e-Sanjeevani setups were not catering to patients at all; although the equipment was sufficient and of the latest version, it was not being used and was lying idle. The facilities with less physical outpatient department activity were providing fewer teleconsults and vice versa. The number of teleconsultations at Piramal facilities was very much less (2-3/day) than physical consultations (50 – 100 /day). The conversion rate could be increased. No formal training was ever given to the provider staff at these facilities. There was no Information, Education and Communication (IEC) in the community regarding the availability of the services. Most of the facilities were deficient in diagnostic and emergency care services leading to low trust in the health facility. This acts as a barrier to accepting telemedicine.

Thirty-nine people were interviewed, of whom 10 were telemedicine staff and 29 were patients. Barriers to telemedicine reported by the patients were lack of awareness of the existing telemedicine services until recently (75.9%), lack of Digital understanding and literacy (55.2%) and poor network connection (82.8%) which they felt impelled them to prefer physical in person consultation over telemedicine services at the facility. (Table 2) Difficult terrain and the distance they have to walk to access to the facility were also identified as barriers to adoption (51.7%).

The majority of the staff reported a lack of adequate telemedicine training (70%), resistance to change, lack of a positive attitude towards telemedicine (80%) and a high

Table 2: Demographic profile of the patients (n=29) and perceived challenges faced by patients at health facilities providing telemedicine.

Characteristics	n (%)	
Age (years)	25-35	11 (37.9)
	36-45	4 (13.8)
	46-55	9 (31.0)
	>55	5 (17.2)
Gender	Male	17 (58.6)
Education	Primary	13 (44.8)
	Secondary	8 (27.6)
	High school	3 (10.3)
	Graduate	5 (17.2)
Awareness of availability of telemedicine	Yes	7 (24.1)
Availed telemedicine	Yes	2 (6.9)
Demographic barrier	Yes	15 (51.7)
Education barrier	Yes	16 (55.2)
Technology barrier	Yes	16 (55.2)
Network availability	Yes	5 (17.2)
Language/communication barrier	Yes	10 (34.5)
Preference of physical consultation	Yes	29 (100)

workload (60%). Technical Shortage of human resources and low education levels and digital literacy of the local population and technical issues like network connectivity (80%), were the major reasons for the underutilisation of telemedicine services in their area. (Table 3)

Table 3: Demographic profile of the providers (n=10) and perceived challenges faced at health facilities providing telemedicine.

Characteristics	n (%)	
Age (years)	25-35	6 (60)
	36-45	3 (30)
	46-55	1 (10)
	>55	0 (0)
Gender	Male	7 (70)
Designation	Medical Officer	3 (30)
	Staff nurse	2 (20)
	Pharmacist	2 (20)
	Coordinator	3 (30)
Formal Training	Yes	3 (30)
Adequacy of training	Yes	2 (20)
	No	1 (10)
	Not Applicable	7 (70)
Availability of Institutional framework	Yes	10 (100)
Technical barrier	Yes	3 (30)
Ease of handling telemedicine interface	Yes	6 (60)
	Never performed	4 (40)
Language barrier	Yes	0 (0)
Fear of Risk	Yes	5 (50)
Workload	Yes	6 (60)
Preference	Telemedicine	2 (20)
	In-person consult	8 (80)

Discussion

Even though telemedicine facilities were available in these centres, telemedicine was less commonly used than the conventional in person doctor patient consultation. Lack of awareness among rural population and reluctance of the staff are the major hindrances to standard delivery of telemedicine services in rural and remote areas.

Strong IEC and media publicity regarding availability of services may be conducted through local health Administrative authorities, to increase the awareness, penetration and the acceptance of telemedicine services at local level. A citizen centric communication approach is required for better adoption at as an informed choice. Merely imposing the programme through a top-down approach is a less effective strategy. Involvement of Panchayati Raj Institutions (PRI) - a form of governance at village level, local bodies, and NGOs is highly recommended to take things forward. The PRIs may be involved for community engagement. The local provider staff must be encouraged to see telemedicine medicine as complementary to the care there are providing.

While there are other barriers, this study provides policymakers with insights into the current perceived challenges to telemedicine implementation, which they can address to increase the penetration of telehealth services, particularly in rural areas.

Limitations of study

The main limitation of this study is that only two blocks of the district were examined. Further studies on challenges based on objective assessment using telemedicine are needed, especially in rural areas and in different States of the country. Further implementation research is highly needed, to corroborate the evidence of adoption and acceptance among providers and users in rural areas.

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