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Original Research Article

Post-pandemic assessment of knowledge, attitude and practices of healthcare professionals regarding telemedicine: a pilot study

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ABSTRACT

Background: The COVID-19 pandemic has accelerated the adoption of telemedicine as an alternative method of healthcare delivery, enabling patient care while minimising physical contact. In India, its use is growing, yet understanding healthcare professionals' perspectives remains essential for effective integration.
Methods: A cross-sectional survey was conducted among healthcare professionals working in India. Data were collected using an online questionnaire comprising 15 structured, self-administered, and closed-ended questions. The survey captured demographic details such as age, gender, and profession. Responses were tabulated and manually analysed to assess knowledge, attitudes, and practices regarding telemedicine.
Results: Most participants (86.23%, n=238) reported being familiar with the concept of telemedicine, including knowledge of relevant applications, platforms, and professional training. A large majority (84.43%, n=233) agreed that telemedicine could reduce patient travel costs, thereby improving accessibility to healthcare services.
Conclusion: The study indicates that telemedicine is perceived positively by healthcare professionals in India and has strong potential as a complementary tool in healthcare delivery. Its integration could enhance access, reduce costs, and improve patient convenience, particularly in underserved areas.

Keywords: COVID-19, Post-pandemic, Healthcare professionals

INTRODUCTION

A pandemic happens when an infectious disease spreads across countries or even the whole world. During the COVID-19 crisis, telemedicine became an important way to provide healthcare without the need for people to meet in person. The word "telemedicine" comes from the Greek word tele, meaning "distance," and the Latin word mederi,

meaning "to heal".[1] In simple terms, it means using technology to diagnose, treat, and advise patients from a distance. The heavy workload and stress faced by healthcare workers during the pandemic also encouraged its use. Today, with tools like the internet, computers, and video calls, telemedicine makes it possible for doctors to consult with patients, plan treatments, and share medical records securely from anywhere. It also helps improve coordination among healthcare teams. The main areas where telemedicine has replaced or supported usual practices include patient–doctor communication, online staff meetings, working from home, planning treatments, and routine follow-ups.[2]

In India, telemedicine has been slowly growing over the years. Organisations such as the Indian Space Research Organisation (ISRO), the Department of Information Technology (DIT), the Ministry of External Affairs, the Ministry of Health and Family Welfare, and state governments have all played a role in promoting it.[3] However, there is still a big gap between how important telemedicine is and how much it is actually used.[4] Common challenges include poor infrastructure, unclear regulations, limited access in rural areas, and worries about data privacy. In March 2020, the Government of India released the 'Telemedicine Practice Guidelines,' adding them to the Indian Medical Council's rules for professional conduct and ethics.[5] As the country moves beyond the pandemic, it is important to understand the knowledge, attitudes, and practices (KAP) of healthcare professionals toward telemedicine. Knowing what encourages them to use it and what holds them back will help in making it a stronger part of India's healthcare system.

METHODS

The study was a cross-sectional descriptive study conducted online across social media especially focusing on India through Google Forms from January 2025 to March 2025. The target population included all healthcare professionals (HCPs) working in India, selected using convenience sampling. Data were collected using an online questionnaire consisting of 15 structured, self-administered, and closed-ended questions aimed at assessing knowledge, attitudes, and practices regarding telemedicine. The questionnaire also included a section outlining the study's aim, objectives, voluntary informed consent, and a declaration of confidentiality. The questionnaire link was distributed to all eligible participants, and adequate time was given for responses. Reminder messages were sent during the data collection period to encourage participation. Before the main survey, a pilot test was conducted on 30 participants to evaluate the response rate and identify any modifications needed. Content validity was assessed by subject matter experts, and reliability testing using Cronbach's alpha yielded a value of 0.8. Following necessary revisions, the finalized questionnaire was disseminated. All collected data were kept confidential and subsequently tabulated for analysis.

Inclusion criteria

Participants working in India, in the age group of 18-74 years (WHO survey age groups), willing to give informed consent for the present study, who had internet access, and filled the questionnaire completely were included in the present study.

Exclusion criteria

Subjects who had filled the questionnaire incompletely, and pilot survey participants were excluded from the present study.

The recent pandemic (COVID-19) has affected people mentally, physically, and financially worldwide. Hence, for the present study, data collection from different geographic locations or populations was necessary to check the effectiveness and applicability of the present study. The present pilot study represents a collaborative effort between researchers from four different countries and seven different cities of India. The diverse expertise and available resources through such collaborations were pivotal in addressing multifaceted aspects of the present research. With the use of innovative methodologies and digital technology, we studied diverse populations from various countries and cities. This comprehensive approach significantly enhanced the applicability of our findings.

RESULTS

Out of 400 healthcare professionals, 276 responded (response rate, 69%). Most of the participants belonged to the 25- to 34-year age group (50.36%, n=139) and were females (60.15%, n=166) (Table 1). A total of 86.23% (n=238) participants knew the concept and had knowledge of professional training (67.03%, n=185). Also, they knew about various apps and mediums/platforms (Table 2). In total, 84.43% (n=233) participants agreed that telemedicine cuts down the travel costs of patients. Also, they agreed that government and educational institutions need to increase their emphasis on telemedicine education (Table 3). It was found that 42.75% (n=118) participants were already practicing it with the help of internet but they did not have separate staff assigned for it (70.65%, n=195) (Table 4).

Table 1: Demographic details of study participants (n=276).

Variable	Subgroup	N (%)
Age (in years)	<18	0
	18-24	108 (39.13)
	25-34	139 (50.36)

Continued.

Variable	Subgroup	N (%)
	35-44	23 (8.33)
	45-54	3 (1.08)
	55-64	2 (0.72)
	65-74	1 (0.3)
	>74	0
Gender	Male	110 (39.85)
	Female	166 (60.15)

Table 2: Knowledge of healthcare professionals about telemedicine.

Questions	Yes (%)	No (%)
Do you know the concept of telemedicine?	238 (86.23)	38 (13.77)
Do you know u can get trained professionally in the use of telemedicine?	185 (67.03)	91 (32.97)
Do you know about various mediums/platforms used for teleconsultation?	163 (59.06)	113 (40.94)
Do you know about telemedicine apps?	143 (51.81)	133 (48.19)

Table 3: Attitude of healthcare professionals towards telemedicine.

Questions	Agree (%)	Uncertain (%)	Disagree (%)
Do you think you have enough technical knowledge about phone/tab/laptop in terms of using telemedicine?	165 (59.78)	89 (32.25)	22 (7.97)
Do you agree that it is challenging to implement effective telemedicine in India?	176 (63.77)	74 (26.81)	26 (9.42)
Do you agree that telemedicine can cut down the costs of patient travels?	233 (84.43)	30 (10.87)	13 (4.71)
Do you think telemedicine can help professionals and patients to save time?	227 (82.24)	36 (13.04)	13 (4.71)
Do you think government and educational institutions need to increase their emphasis on telemedicine education?	226 (81.88)	35 (12.68)	15 (5.43)
Do you think telemedicine can reduce the quality of doctor-patient relationships?	142 (51.45)	69 (25)	65 (23.55)
Do you think teleconsultation is economical for doctors and patients both?	202 (73.19)	43 (15.58)	31 (11.23)

Table 4: Practices of healthcare professionals regarding telemedicine.

Questions	Very often (%)	Yes (%)	Sometimes (%)	No (%)
Do you use the internet in your routine practice to get the information of patients?	11 (3.98)	118 (42.75)	99 (35.87)	48 (17.39)
Have you been practicing telemedicine since the pandemic started?	7 (2.54)	80 (28.98)	70 (25.36)	119 (43.12)
Have you been asked to provide teleconsultation by your patients?	5 (1.81)	97 (35.14)	64 (23.19)	110 (39.85)
Do you have separate provision/staff available for teleconsultation?	7 (2.54)	47 (17.03)	27 (9.79)	195 (70.65)

DISCUSSION

KAP surveys are useful in recognizing the bridge between knowledge and behavioural approaches in order to carry out essential actions. International collaborations and data collection from different cities helped in the present study to ensure that findings were broadly applicable and relevant to a wider audience. In spite of the uneven geographic distribution, the present pilot study was successfully managed to enhance the outcomes using digital technology. In the present study, 276 healthcare professionals (participants) completed the questionnaire. Most participants were females (60.15%, n=166), and belonged to the age group of 25-34 years. Most of them (86.23%, n=238) knew about the concept of telemedicine and few (59.06%, n=163) were aware of the various

platforms/mediums available for teleconsultation. In a similar study conducted by Murshidi et al., 51.5% of the participants were aware about the concept of telemedicine, whereas 24.9% had observed it in action and only 14.2% had tried using telemedicine during their practice [6]. In the present study, 28.98% (n=80) of the participants agreed that they were using telemedicine since the inception of the pandemic and 2.98% of the participants reported that they use it often. Most of the participants in the present study agreed that telemedicine can cut down on patients' travel costs (84.43%, n=233), can help both professionals and patients to save time (82.24%, n=227) and is overall economical for both doctors and patients (73.19%, n=202), but they also thought that telemedicine can reduce the quality of doctor-patient relationships (51.45%, n=142) and it is relatively challenging to implement effective telemedicine in India (63.77%, n=176). In a study conducted among French medical students and residents, 82.8% acknowledged the relevance of telemedicine for improving access to healthcare and 14% stated they had previously practiced telemedicine during their studies. The majority of respondents, however, acknowledged that they had not received enough training in telemedicine but expressed a desire to do so before finishing their degrees, intending to engage in telemedicine in the future.[7] Giraudeau et al reported that 57.1% of dentists in private practice were unaware of the concept of tele dentistry and only 39.3% of dentists said that they had used telemedicine at least once. A total of 69.1% of dentists who had at least once practiced tele dentistry felt, either fully or partially, that it was a meaningful solution to enhance access to dental care; yet, 9.2% of them saw it as a threat to traditional dental practices.[8]

Another study conducted in Pakistan reported that 80.7% of the doctors knew what telemedicine was, and 28.1% of them thought that it was an effective means to deliver faster medical care, while 23.2% thought it was a method to reduce the "white coat syndrome" that patients experience after encountering doctors. A total of 42.9% of participants, however, thought that telemedicine violated patient privacy and weakened the doctor-patient relationship.[9] Doctor-patient relationship challenges have been raised regarding the establishment of rapport between the two where patients believes that video consultations distance them from their healthcare provider.[10] Software updates, device malfunctions, platform failures for video consultations, data confidentiality and technological barriers are some of the challenges according to the previous literature.[11-16]

The present study has its own limitations. Cross-sectional studies are carried out at a single point in time, and there is no follow-up. Further studies that include larger sample sizes are recommended with modifications in variables.

CONCLUSION

The survey results indicate that while a noticeable number of healthcare professionals have engaged with telemedicine since the pandemic began, with 28.98% actively practicing it, a significant portion (43.12%) have not yet utilized these services. This disparity highlights existing barriers to its broader adoption, suggesting that many professionals may require additional resources or motivation to integrate telemedicine into their practices effectively. Furthermore, although awareness of telemedicine is high, with 86.23% of respondents familiar with the concept, there is a clear need for enhanced training and institutional support. By addressing these gaps, healthcare systems can better equip professionals to leverage telemedicine, ultimately improving patient care and streamlining healthcare delivery in the ongoing evolution of digital health.

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