

ORIGINAL RESEARCH

Evaluation of the knowledge, perception, and willingness towards telemedicine among healthcare workers in Mumbai

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ABSTRACT

Introduction/Background: Telemedicine or telehealth is a form of remote diagnosis and treatment of patients by means of telecommunications technology. After COVID Pandemic this trend of using technology is going to stay, and India also has been caught up in this swell of change in the healthcare environment, and both the government and private sectors are vigorously taking steps by promoting innovations, developing new applications and platforms, making policy changes, ensuring education, and conducting advocacy activities. **Material & Methods:** A descriptive cross-sectional structured questionnaire-based survey was conducted over a two-month period among healthcare workers in tertiary care center and private practitioners in a Western suburb in a city in Maharashtra, India to determine the knowledge, perception, and willingness of telemedicine. There were 100 doctors (41 male and 59 female) who agreed to fill a pre-validated self-administered questionnaire that was distributed through Google Forms. **Results:** Among the 100 respondents, 59% were female. 56% were aged less than thirty years and 44% were aged between thirty to fifty years. The majority of the respondents were from the clinical branches. 32% of the respondents were resident trainee doctors followed by Interns forming 20%. 92% of the respondents had less than 10 years of experience. About 51% had already done telemedicine consultation in the past. 72% of the total population reported good knowledge of telemedicine including its applications. However, only 30% were familiar with the telemedicine guidelines. 44% of them had heard about telemedicine from their hospital or workplace and 36% from their colleagues. According to professional designation, the majority of the resident trainee doctors had good knowledge (33.33%), good perception (32.22%) and good willingness (30.76%) towards Telemedicine. **Conclusion:** Telemedicine can be an efficient and beneficial conduit between a patient and a doctor with an established ongoing relationship. The doctors should ensure that their use of telemedicine is compliant with the Telemedicine Guidelines, the regulations laid down by the National Medical Commission and as well as the Information Technology Act.

Keywords: perception, knowledge, telemedicine, attitude

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INTRODUCTION

In recent decades, there have been great advancements in Information Technology, telemedicine, telehealth, and e-health in healthcare systems.¹ Telemedicine and telehealth are important tools for growth in healthcare delivery systems using various forms and methods like smartphones, email, video conferencing and other tools especially in rural areas all over the country.² Telemedicine in easier terms is the use of electronic information and communication technology to provide and support clinical care remotely as well as patient support and professional health related education, public health,

and health administration when distance separates the participants.³

World Health Organization defines telemedicine as, "The delivery of healthcare services, where distance is a critical factor, by all healthcare professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation and for the continuing education of healthcare providers, all in the interests of advancing the health of individuals and their communities."⁴

In India, providing in-person healthcare is particularly challenging, given the large geographical distances and limited resources. One of the major advantages of telemedicine can be for saving the cost and effort especially of rural patients, as they would not need to travel long distances for obtaining consultation and treatment.⁵ In this type of scenario, telemedicine may provide an optimal solution not just for providing timely and faster access but would also reduce financial costs associated with travel. It also reduces the inconvenience and impact to family and caregivers taking into account social factors.⁶ Telemedicine can also play a particularly significant role in cases where there is no need for the patient to physically see the physician e.g., for regular, routine check-ups or continuous monitoring. Hence, telemedicine can reduce the burden on the secondary hospitals.⁷

With telemedicine, there is also a point that the higher likelihood of maintenance of records and documentation minimizes the likelihood of missing advice from the doctor and other health care staff. In contrast, the doctor has the exact document of the advice provided via tele-consultation. Written documentation increases the legal protection of both parties involved. Telemedicine provides both patient's as well as health workers safety especially in situations where there is risk of contagious infections like pandemic conditions.⁸ There are a number of technologies and applications that can be used in telemedicine, which can help patients adhere better to their medication regimens and manage their diseases better. Telemedicine also enables the availability of vital parameters of the patient to the physician with the help of medical devices such as blood pressure, blood glucose, etc. management which can give information remotely to the physician. An extensive review of literature in the field of telemedicine in India resulted in discovery of a few publications in the identification of barriers, challenges of telemedicine, knowledge, and attitude of healthcare workers towards telemedicine.⁹

The present study was conducted to assess the knowledge and perception of telemedicine and its applications among healthcare workers. It also aimed to evaluate their willingness towards adopting telemedicine in clinical practice.

METHODOLOGY

A cross-sectional survey was carried out among medical doctors and interns i.e., both preclinical and clinical working in a public sector hospital in Western Suburbs of Mumbai to determine their Knowledge, Attitude and Perception regarding the use of Telemedicine. The data was collected over a period of 2 months between May 2022 and June 2022. The sample for this study was calculated by using a single population proportion formula using Open-Source Epidemiologic Statistics for Public Health (OpenEpi) version 3 using reference literature, and sample size

was calculated to be 88 with a confidence interval (CI) of 95%, and a 5% margin of error. However, this figure was rounded off to 100.

A self-designed questionnaire prepared and modified after a comprehensive review of literature using Google forms and propagated using social media. Participation was voluntary and no incentives were awarded. The questionnaire included 4 parts. The first part of the questionnaire consisted of demographic information and included six items: Age, Gender, Specialty, Designation, Years of Experience, whether they had done telemedicine consultations.

The second part was composed of eight questions to evaluate their knowledge about telemedicine. The third part consisted of thirteen questions assessed their perception towards telemedicine. The other questions were answerable with a Yes, No and Maybe and how should Telemedicine be practiced?

The fourth part assessed the willingness of the healthcare workers to adapt telemedicine. The answers were rated based on a 5-point Likert scale (1-Strongly agree to 5-Strongly disagree).

Part 2, Part 3 and 4 were assessed through dichotomous variables. While Part 2 has Yes (Score=1) and No (Score=0) for six questions. Each respondent can score a minimum of 0 and a maximum of 6 in knowledge. While in Part 3 and Part 4 has a 5-point Likert scale, the responses are Strongly Agree (Score=2), Agree (Score=1), Neutral (Score=0), Disagree (Score=-1) and Strongly Disagree (Score=-2), the minimum score of -20 and maximum score of +20 in perception and a minimum score of -10 and maximum score of +10 can be scored by the respondent.

In this study an average score of 50% was used as a cutoff point to determine knowledge, perception, and willingness towards telemedicine. The data obtained was compiled, analysed, and tabulated in Microsoft Excel 2016. Descriptive statistics like frequency and percentages were used.

RESULTS

A total of 100 respondents were included in this study, both male (41%) and female (59%). Majority of the respondents were aged less than 30 years (56%) and were from the clinical branches. 32% of the respondents were resident trainee doctors. 92% had less than 10 years of experience. About 51% had done telemedicine consultation in the past. The highest number of respondents were neither from any field or plain MBBS graduates (37%) followed by clinical specialties (Table 1).

Characteristic	No. of respondents (n=100)	%
Gender		
Male	41	41
Female	59	59
Age (in years)		
<30 years	56	56
30-50 years	44	44
>50 years	0	0
Years of Experience (in years)		
<10 years	92	92
10-20 years	6	6
>20 years	2	2
Designation		
Consultant	4	4
Associate Professor	4	4
Assistant Professor	16	16
Registrar	3	3
Senior Resident	2	2
Resident Trainee	32	32
Medical Officer	16	16
Private Practitioner	3	3
Intern	20	20

Table 1:- Demographic Characteristics and designations of respondents.

Out of 100 participants 51 (51%) were found to never had done a telemedicine consultation ever whereas 49 (49%) participants had done telemedicine consultation (Figure 1).



Figure 1:- Telemedicine consultation done by participants.

Out of the 51 respondents who had answered “Yes” to the question “Have you done any telemedicine consultation?” were asked a series of questions which was recorded in the table.

Sr.No	Question	Yes	%	No	%
1.	Had telemedicine service provided required results in your patient’s diagnosis/ treatment?	48	94.11	3	5.88
2.	Was the patient content with the treatment received through telemedicine?	46	90.20	5	9.80
3.	Has telemedicine been beneficial for your practice?	42	82.35	9	17.64
4.	Would you promote telemedicine consultation among your colleagues?	42	82.35	9	17.64

Table 2:- Questions related to telemedicine consultation.

72% percentage of the total population reported good knowledge of telemedicine knowledge including its application out of which 59.72% were females, 54.17% were aged less than 30 years of age and 91.67% had less than 10 years of experience. However, only 30% were familiar with the Telemedicine guidelines. As per their professional designation, majority of the healthcare workers were residents (33.33%) followed by Interns.

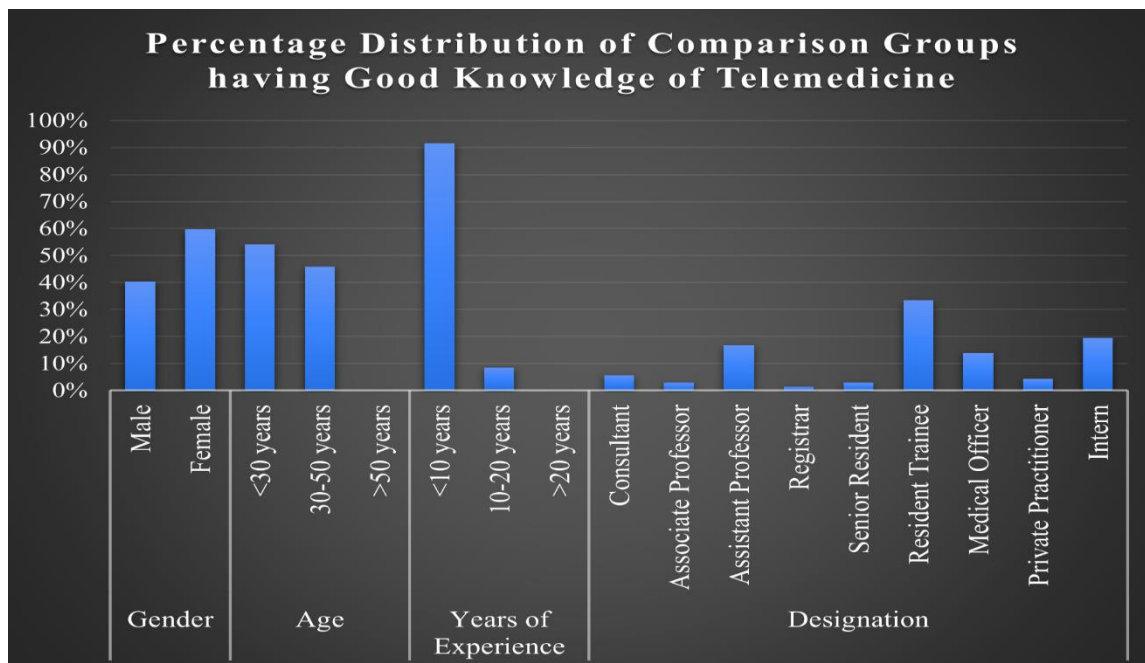


Figure 2:- Percentage Distribution of comparison groups having good knowledge of telemedicine. 44% of them had heard about telemedicine from their hospital or workplace. 49% revealed that information was never given at their workplace regarding telemedicine (Figure 2).



Figure 3:- Information obtained by the participants at workplace

90% had a good perception towards telemedicine out of which 60% were females, 55.55% were aged less than 30 years and 93.33% had less than 10 years of experience. 90% could either see themselves using or considered using the services of Telemedicine and 56% agreed that it should be free, and doctors should be paid by the Government. A large number thought that all modes should be used to practice telemedicine but preferred was video call (29%).

Question	Response	Number
How should Telemedicine be practiced?	Videocall	29
	Voicecall	2
	Email	0
	All of the above	69
	Total	100

Table 3: Opinion of participants about the way telemedicine should be practiced.

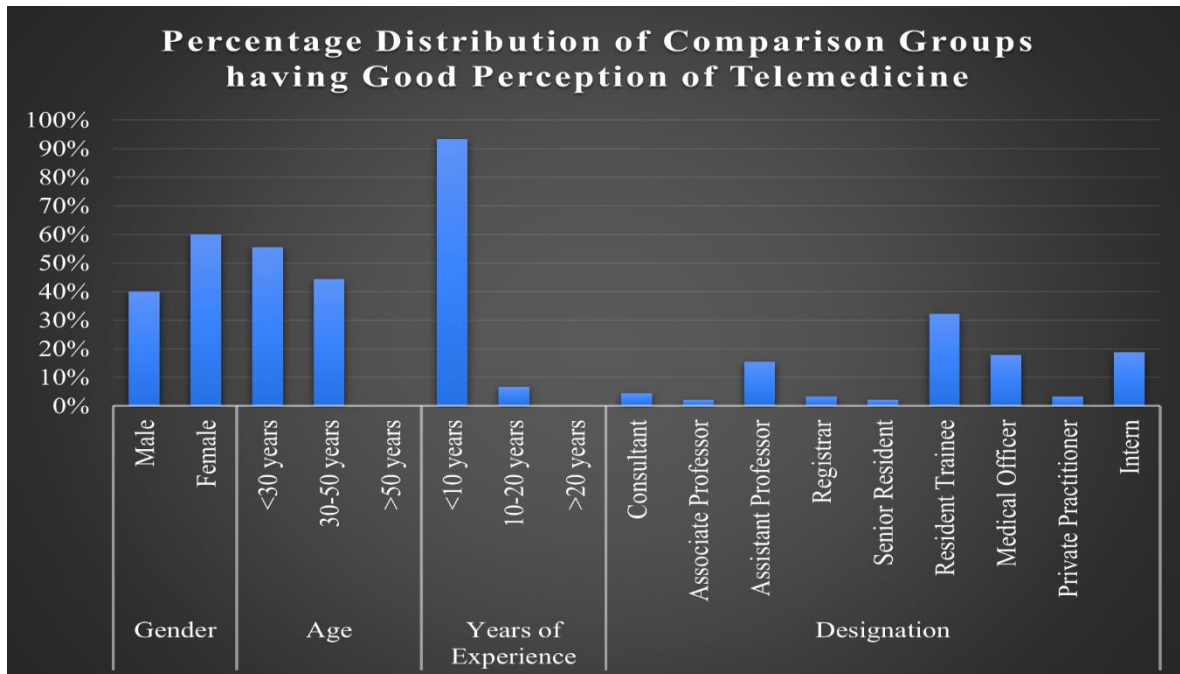


Figure 4: Percentage distribution of comparison groups having good knowledge of telemedicine.

Almost 79% of the respondents showed good willingness to adopt telemedicine out of which females were a higher number, majority were aged less than 30 years, almost the maximum had less than 10 years of experience. As per the professional designation almost 30.37% were resident trainee doctors followed by 22.78% who were interns and 17.72% who were assistant professors.

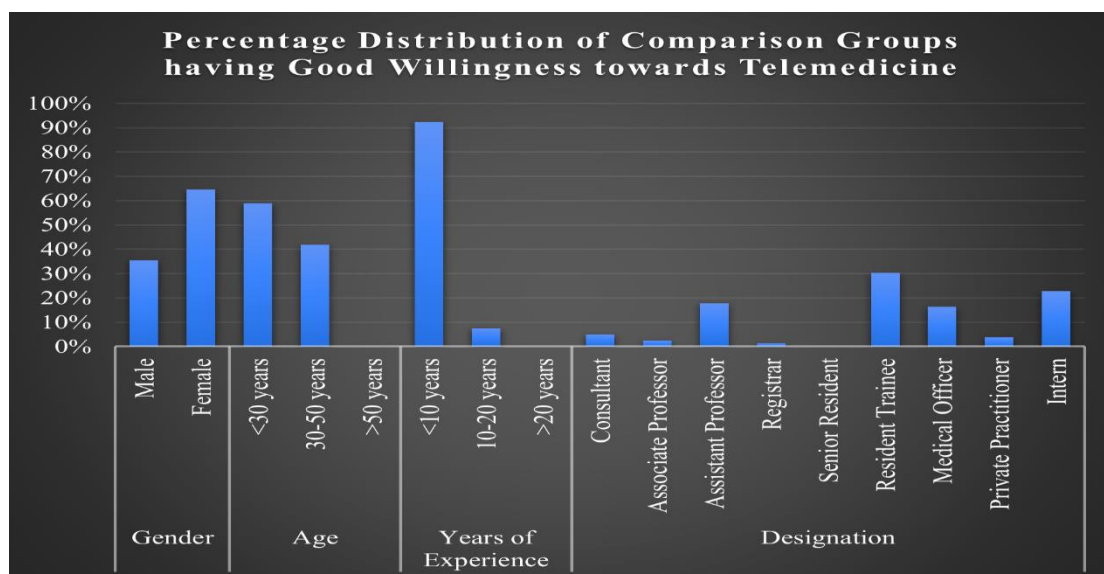


Figure: Percentage distribution of comparison groups having Good Willingness towards Telemedicine.

DISCUSSION

The need for telemedicine and its importance has become clear more than ever during these trying and testing times of pandemic.

Studies conducted in European regions which showed high level of knowledge of telemedicine (84%).¹⁰ similar to our study which suggested that 72% of the healthcare workers had a good knowledge of various aspects of telemedicine. Our study has comparatively higher rates than other similar studies conducted in Ethiopia, India, and Iran. A study conducted in Northwest Ethiopia found that most of the health professionals had poor knowledge of telemedicine and even fewer had heard about their telemedicine¹¹ which was similar to a study in the Puducherry region.

A majority of 93% agreed that continuous training is required for doctors in the use of Telemedicine which physicians have similarly agreed in a study conducted in Saudi Arabia and Germany.¹³

When asked how often information is given about telemedicine at your workplace only 5% and 2% have said that information has been often or always given in their workplace about telemedicine while almost 49% have said that they have never received any information from their workplace regarding telemedicine guidelines. A similar study emphasized the need to strengthen telemedicine system by arranging conferences and training sessions with respect to telemedicine.¹⁴

Our findings suggest that as the study was conducted after the pandemic, it may be a contributing cause as telemedicine was used during the pandemic for consultation as well as medical education, online training, webinars, and conferences being conducted, and telemedicine guidelines being released.¹⁵

Patients from rural areas have to travel longer distances and spend or lose money in tertiary hospitals. Almost half of the respondents felt that telemedicine was a viable approach to providing medical care services to patients and agreed that there is a potential for information and communications technology in healthcare and a similar number was found in a study among French medical students.¹⁶

Majority of the respondents agreed that use of telemedicine can save time, money, and efforts. In a study conducted among medical and allied health care students more than 80% felt the same¹¹ Similar positive perceptions were seen in studies done in West Bengal in India, in Riyadh, Saudi Arabia and in earlier studies in Ethiopia and Pakistan too.^{5,12,7,13} However, in a study conducted in rural India lesser number of healthcare providers strongly agreed that telemedicine will save time and efforts.¹⁷

61% of respondents have strongly agreed or agreed that telemedicine will change the doctor patient relationship while 27% were neutral about it which was vaguely similar in a study done in Germany change which was anticipated to be 54%.¹⁰ In the study in Karachi, Pakistan 42.9% opined that

telemedicine might disrupt the doctor– patient relationship.¹⁸

The majority of the respondents in our study showed a willingness to adopt telemedicine technology (79%). Almost 60% agreed that they thought their colleagues would be willing to implement telemedicine technology. Similar findings were reported by medical students in India as well in a study done in Riyadh, Saudi Arabia where the majority of the participant's agreed that their colleagues were willing to implement telemedicine and further would like to watch a procedure as it is taking place (between 90 to 95%). Almost 64% of the respondents were willing to consult with tertiary care hospitals/ doctors in their speciality while 32% were neither here nor there. However, a higher value was reported in Saudi Arabia which stated their willingness to start telemedicine and use it for consultation in larger hospitals.¹⁹ Similar findings were also reported by Malhotra et al.²⁰

CONCLUSION

Telemedicine cannot be the answer to all problems, but it can be particularly important in addressing a vast range of problems. Services like tele-health, tele-education and tele-home healthcare are proving to be innovative in the field of healthcare. The importance of satellite remote communications is highlighted in the field of disaster management when all terrestrial modes of communication are disrupted. International telemedicine initiatives have brought and are bringing the world closer, and hence distance is no longer a barrier in fulfilment of quality healthcare. Despite having immense potential, telemedicine has still not attained the 'boom' which it was meant to create. Lack of awareness and acceptance of innovative technology both by the public and the professionals are holding it back. Governments have now started to take a keen interest in developing telemedicine practices that has been resulting in a slow but steady rise in its application in public health. Hopefully in the next few years, telemedicine practices will reach their true potential.

Conflict Of Interest: None

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