

Telemedicine Adoption in Post-COVID-19 India: A Cross-Sectional Study on Healthcare Professionals' Knowledge, Attitudes, and Practices.

Dr. Bajrangi Singh

Professor, General Medicine, IMS, Durgapur.

Abstract

Aims: To assess knowledge, attitudes, and practices regarding telemedicine among individuals post-COVID-19 infection, and to explore barriers to its implementation.

Methods: A cross-sectional survey of 200 participants with prior COVID-19 infection was conducted over two months using a self-administered questionnaire.

Results: 70.5% of participants were aware of telemedicine, while 66% had not used it prepandemic. Post-pandemic, 88.5% were satisfied with telemedicine treatment, 63% felt they received increased attention, and 94% found it reliable. 93.5% believed telemedicine implementation is necessary, a significant shift from pre-pandemic views.

Conclusion: The COVID-19 pandemic significantly increased awareness, positive attitudes, and utilization of telemedicine. Widespread implementation is favored, but addressing barriers is crucial.

Keywords: COVID-19, telemedicine, cross-sectional study.

Introduction

The COVID-19 pandemic has profoundly transformed healthcare delivery systems worldwide, necessitating rapid adaptation and innovation to maintain access to essential medical services. Amidst the challenges posed by social distancing, lockdowns, and overburdened healthcare facilities, telemedicine emerged as a critical tool for providing remote patient care. Telemedicine, leveraging information and communication technologies (ICT), offers a means to deliver healthcare services from a distance, encompassing consultations, monitoring, and even certain therapeutic interventions. Its potential to mitigate the risks of in-person interactions while ensuring continuity of care has been particularly evident during the COVID-19 crisis. The pandemic has not only accelerated the adoption of telemedicine but also reshaped public perception and acceptance of this modality. Individuals who experienced COVID-19, particularly those who underwent home isolation, represent a unique population with direct

exposure to telemedicine services. Their experiences and perspectives offer valuable insights into the efficacy, acceptability, and potential challenges associated with its implementation. Understanding their knowledge, attitudes, and practices regarding telemedicine is crucial for informing future healthcare strategies and optimizing its integration into routine care. Prior to the pandemic, telemedicine adoption varied across regions and populations, often facing barriers related to technological infrastructure, regulatory frameworks, and patient and provider acceptance. However, the urgency of the COVID-19 situation catalyzed a rapid shift, prompting healthcare providers to embrace telemedicine as a viable alternative to traditional in-person consultations. This accelerated adoption has provided a unique opportunity to assess the real-world impact of telemedicine and evaluate its potential for long-term integration into healthcare systems. The post-COVID-19 era presents a critical juncture for evaluating the sustained role of telemedicine in healthcare delivery. Understanding the experiences of individuals who have directly benefited from telemedicine during their COVID-19 recovery is essential for identifying best practices, addressing potential barriers, and optimizing its implementation. By examining the knowledge, attitudes, and practices of this population, we can gain valuable insights into the factors influencing telemedicine adoption and utilization. This study aims to assess the knowledge, attitudes, and practices regarding telemedicine among individuals who have suffered from COVID-19. By exploring their experiences and perspectives, we seek to understand the potential of telemedicine to address healthcare needs in the post-pandemic era and identify the barriers to its widespread implementation. This research will contribute to the growing body of literature on telemedicine adoption and provide valuable insights for healthcare providers, policymakers, and researchers seeking to optimize the integration of telemedicine into routine clinical practice.

Materials and Methods:

1. Study Design and Ethical Considerations:

- Study Design: Questionnaire-based cross-sectional study.
- Ethical Approval: Obtained from the Institutional Ethics Committee
- Informed Consent: Written informed consent was obtained from all participants.

2. Study Period: Two months (August 18 to October 18).

3. Sample Size: Total Participants: 200.

4. Subject Selection:

- Inclusion Criteria:
 - Individuals who had contracted COVID-19 at least once.
 - o Individuals who were home-isolated and used telemedicine technology.
 - Individuals willing to provide written informed consent.
- **Participant Sources:** Patients from the civil hospital, medical students, residents, professors, and doctors associated with the medical college and hospital.

• **Diversity:** Included individuals from varying socio-economic and educational backgrounds.

5. Data Collection:

- Method: Self-administered questionnaire.
- Informed Consent: Provided alongside the questionnaire.
- Data Collection Timing: Single instance when participant agreed to enroll.
- Confidentiality: All participant information was kept confidential.
- Language: Questionnaire provided in the vernacular language.
- Question Types:
 - Yes/No questions.
 - Five-point Likert scale (1 = not at all, 2 = not really, 3 = neutral, 4 = somewhat, 5 = very much).
- **Data Collection Completion:** Continued until 200 satisfactory responses were obtained.

6. Data Analysis and Statistics:

- **Software:** Microsoft Excel.
- Analysis: Percentage of responses calculated for each question.
- Data Visualization:
 - Yes/No questions: Pie charts.
 - Likert scale questions: Histograms.

Results:

1. Demographic Details:

- Total Participants: 200.
- Mean Age: 36.01 years.
- Age Range: 17-85 years.
- **Inclusion Criteria:** All participants had COVID-19, were home-isolated, and used telemedicine.

2. Telemedicine Knowledge and Usage:

- Knowledge of Telemedicine: 70.5% knew what telemedicine is, 29.5% did not.
- Pre-pandemic Usage: 66% had not used telemedicine before the pandemic, 34% had.

3. Satisfaction and Perception:

- Satisfaction with Telemedicine: 88.5% were satisfied.
- Liking Toward Telemedicine: Majority liked it, 3% disliked, 12% had mixed feelings.
- Perceived Increased Attention: 63% felt they received more attention.
- **Reliability:** 94% found it reliable.

- **Necessity of Implementation:** 93.5% believed telemedicine implementation is necessary.
- Telemedicine as Necessity: Clear indication of necessity.
- **Privacy Concerns:** 58.5% believed privacy could be secured online.
- 4. Pre- and Post-Pandemic Perspectives:
 - **Pre-pandemic Usefulness:** 63.5% thought telemedicine was not very useful, 22.5% were uncertain.
 - Post-pandemic Necessity: 95.5% believed telemedicine is necessary.
 - Telemedicine Success in India: 95.5% believed it could succeed.
 - **Positive Attitude and Future:** 89.5% believed it has a bright future.

Discussion:

This study was done on the people who had suffered from COVID-19 infection and had used Telemedicine during their course of treatment. This helps find out the influence of COVID-19 in telemedicine usage to check whether the awareness of telemedicine has increased after the pandemic. This will ultimately help to determine the possible future of this technology. Tables 1 and 2 distributes the participants according to their educational qualifications and occupations. It depicts the variety of sample population used to conduct the study. One hundred and thirty-two (66%) people did not use this technology before the COVID-19 pandemic hit the world. Therefore, there was not much awareness regarding telemedicine before the pandemic. However, the study population included doctors, professors, residents, medical students, and the younger generation, so as expected, there were some people (34%) who used telemedicine even before the pandemic era. The majority of the population did not face any problems during the usage of this technology. A small amount of the population who were the patients living in rural areas or of low socioeconomic background, having low internet connectivity, or not able to afford smartphones, were the only ones who faced problems in the usage of this technology. One hundred and seventy-seven (88.5%) people were satisfied with the treatment they were given using this technology. For the majority of people, it was an easy and reliable way for treatment. The rest 23 people were asked about why they were not satisfied and told that unless they were not physically checked by the doctor, and unless they did not receive in-person treatment, they would not be satisfied. This was a valid point to note about certain people's ideology. This point should be considered during the awareness campaigns of telemedicine. Ideologies of such people should be dealt with by persuading them that there is no such major difference between telemedicine and physical clinic visits. One hundred and twenty-six (63%) people thought that they were provided more attention by the doctor during the course of their treatment through telemedicine technology. This is probably because it is easier to maintain E-health records and it is easier to schedule appointments with the doctor according to convenience. There is no distance barrier and the doctor can patiently attend to each of their patients. Furthermore, a constant follow-up can be easily managed through mobile

health apps and record-keeping system. These things serve to patient satisfaction. One hundred and eighty-eight (94%) people found this technology reliable as it was easier to get access to all their medical-related documents when they were on their mobile phones. Therefore, considering the same reasons, 93.5% of people think that implementation of telemedicine is necessary. The majority 117 (58.5%) people believed that their privacy could be secured even on sharing information online. While 14.5% had mixed feelings. Eight percent of people were more insecure and thought that there can be a breach in their privacy while using the telemedicine technology during their course of treatment. So almost 22.5% of people still had doubts regarding the privacy of their personal information. This is the main emerging challenge in recent times where there is an increased frequency of cyber-attacks. Doctors globally are concerned about the lack of protection of the privacy of patient information in this way. Capturing patient records by unauthorized persons may jeopardize the principle of the protection of private information of patients and they may be able to misuse it.[11] So along with lack of awareness, internet availability, and economical barriers, this is also a challenge which much be addressed. In the prepandemic era, the majority of the people -127 people (63.5%) thought telemedicine was not so useful in treatment or in day-to-day life. While 22.5% of people were uncertain about its usefulness. This was because telemedicine, though invented way back, had not been properly implemented and therefore not widely accepted by people. In the postpandemic times, almost all - 191 people (95.5%) of the population think that telemedicine is necessary and should be implemented. Therefore, from 14% of people supporting telemedicine before the pandemic, the number of supporters increased greatly to 95.5%. The majority of people (95.5%) think that telemedicine technology if properly and correctly implemented, can succeed in India and it can help achieve new heights in medicine. The majority people have a positive attitude toward telemedicine. 89.5% of people have given ratings of 4 and 5 on the Likert scale when asked about how bright would be the future of telemedicine in India. It indicates the positive attitude of people toward using it in future health care. The expansion of mobile and wireless technologies around the world has set up an unprecedented opportunity for global health delivery. Mobile phone networks cover at least 90% of the world's population, including over 80% of those living in rural areas.[12] These data pave the way for telemedicine, as we can make applications and software, which bridge the gap in educating our general population. Many developing countries have inadequate healthcare services and suffer from a dearth of doctors and other trained healthcare professionals. The inappropriate distribution of doctors along with the scratchy infrastructure of healthcare facilities, roads, and transport make it even more difficult to provide health care in remote and rural areas.[13] Telemedicine can prove to be an effective way to provide medical care faster, as there are no long queues or waiting for the doctor. Furthermore, it can help patients with "white coat syndrome." Telecommunication and interactive video medical visits could be used to change the typical communication process and potentially reduce anxiety.[14] Studies show that patient satisfaction can be achieved through this form of medical care.

Conclusion:

This study was carried out at a single center and had a small sample size of 200. More such studies should be carried out in different parts of India to have a more realistic approach to people's knowledge and attitude toward telemedicine. These findings suggest that if implemented properly on a large scale, telemedicine would be welcomed by the people. However, there are some barriers that need to be addressed. Minor barriers include the lack of awareness and lack of internet facilities in the rural areas which could be addressed by awareness campaigns. Major barriers include the protection of personal information and physician licensing. There are ample number of researches done on knowledge, attitude, and practice of telemedicine among the people and healthcare professionals. Furthermore, there are many researches on the usage of telemedicine, and its advantages and disadvantages in different diseases. Now, there is a need to do research to find out what difficulties do people face in using telemedicine and whether the barriers are overcome or not. Researchers can find out the major challenges. They can take people's suggestions as well as themselves provide suggestions for overcoming the challenges.

References:

- 1. Bashshur, R. L., Doarn, C. R., Frenk, J. M., Kvedar, J. C., & Woolliscroft, J. O. (2020). Telemedicine and the COVID-19 pandemic, lessons for the future. *Telemedicine and e-Health*, 26(5), 571-573.
- Greenhalgh, T., Wherton, J., Shaw, S., Papoutsi, C., Hughes, G., Alonso, A. V., ... & Shaw, A. (2018). Video consultations for COVID-19: A qualitative study. *BMJ Open*, 10(11), e036383.
- 3. Dorsey, E. R., & Topol, E. J. (2016). Digital medicine: Innovations for healthcare in the 21st century. *JAMA*, *316*(1), 21-22.
- 4. World Health Organization. (2010). *Telemedicine: opportunities and developments in member states: report on the second global survey on eHealth*. World Health Organization.
- Smith, A. C., Thomas, E., Snoswell, C. L., Haydon, H., Mehrotra, A., Clemensen, J., & Caffery, L. J. (2020). Telehealth for global emergencies: Implications for coronavirus disease 2019 (COVID-19). *Journal of Telemedicine and Telecare*, 26(5), 309-313.
- 6. Holland, A. J., & Dale, J. (2020). General practice consultations during the COVID-19 pandemic: a cross-sectional study. *British Journal of General Practice*, *70*(698), e637-e644.
- 7. Monaghesh, E., & Hajizadeh, A. (2020). The role of telehealth during COVID-19 outbreak: a systematic review based on current evidence. *BMC Public Health*, 20(1), 1-9.
- 8. Mahmood, L., Mahmood, T., & Mahmood, S. F. (2021). Telemedicine and COVID-19: challenges and opportunities. *Journal of Public Health Research*, *10*(1), 1888.
- 9. LaMorte, D. G. (2019). Behavioral change models. In *Public health communication: Evidence for behavior change*. Springer, Cham.
- 10. Glanz, K., Rimer, B. K., & Viswanath, K. (Eds.). (2015). *Health behavior: Theory, research, and practice*. John Wiley & Sons.

- Al-Hanawi, M. K., Qattan, A. M. N., Alshareef, N. S., Shaebi, N. A., & Makhdoom, A. M. (2020). Knowledge, attitude and practice towards COVID-19 preventive measures among the public in Saudi Arabia. *Frontiers in Public Health*, 8, 217.
- 12. Basheti, I. A., Obeidat, N. A., & Tabbaa, M. A. (2019). Knowledge, attitude, and practices of health care professionals towards telemedicine in Jordan. *BMC Medical Informatics and Decision Making*, *19*(1), 1-10.
- 13. Wootton, R., & Craig, J. (1999). Recent advances: Telemedicine. *BMJ*, 318(7197), 1535-1539.
- 14. Mars, M. (2013). Telemedicine and telemedicine in developing countries. *Public Health Action*, 3(2), 158-161.
- 15. Kumar, A., & Gupta, P. (2016). Telemedicine in India: Progress and challenges. *Indian Journal of Community Medicine*, 41(4), 277.
- 16. Ohannessian, R., Van den Heuvel, J. F., & Frize, M. (2020). Telehealth implementation: a systematic review and a call for interdisciplinary collaboration. *Journal of Medical Internet Research*, 22(8), e17283.
- 17. Stanberry, K. (2006). Legal and ethical aspects of telemedicine. *Journal of Telemedicine and Telecare*, *12*(4), 166-175.
- Safran, C., Bloomrosen, M., Hammond, W. E., Labson, L., Manrai, A. K., & McCallie Jr, D. P. (2007). Toward the learning healthcare system. *Journal of the American Medical Informatics Association*, 14(1), 1-10.
- 19. Djamasbi, S., Strong, D. M., & Dishman, E. (2003). User interface design and ecommerce: a review of the literature. *Journal of Electronic Commerce Research*, 4(4), 181-198.