

Original Research



Perceptions in using teleconsultation during the COVID-19 Pandemic in Chennai, South India

Angeline Grace*, Swetha Naik, Rashmi Gour, Umadevi Ramachandran, Sujitha Pandian

Department of Community Medicine, Sree Balaji Medical College and Hospital, Chennai, India

*Correspondence: angelinedr.g@gmail.com

 <https://orcid.org/0000-0002-4692-6066>

DOI: <https://doi.org/10.4038/jccpsl.v30i1.8643>

Received on 16 Sep 2023

Accepted on 22 Jan 2024

Abstract

Introduction: People were reluctant to go to hospitals for consultation, treatment and follow-up during the COVID-19 pandemic. However, the availability of advanced technologies such as teleconsultation enabled individuals to continue receiving healthcare, contact physicians about their symptoms and receive treatment. There has not been much research conducted in Tamil Nadu to evaluate how individuals feel about using teleconsultation to receive healthcare. It is crucial to evaluate the quality of medical care and patients' satisfaction with teleconsultation services.

Objectives: To ascertain attitudes towards using teleconsultation and to describe the quality of healthcare delivered this way during the COVID-19 epidemic in Tamil Nadu, South India

Methods: The participants in this study were inhabitants of Chennai, Tamil Nadu who were at least 18 years old and received at least one teleconsultation during the COVID-19 epidemic. An online, self-administered survey form that was distributed over multiple social media channels was used to gather data.

Results: About 61.2% of the 405 study participants were males. The average age of respondents was 34.6 years (SD=11.4). Almost 95.6% concurred that teleconsultation services have made it simpler to seek healthcare throughout the pandemic. The majority (92.1%) were satisfied with the standard of teleconsultation-delivered medical care. In comparison to direct consultation, 54.3% disagreed to preferring teleconsultation to save money and time. Only 52% of the 92.6% of participants who were instructed to attend a follow-up consultation had done so. 90% of respondents said they would still prefer to speak with doctors directly in the future.

Conclusions & Recommendations: Although teleconsultation services, in the opinion of many participants, improved access to healthcare during the epidemic, they still prefer to consult healthcare professionals directly in the future. Teleconsultation serves as an effective alternative to direct consultation especially in times of globally emerging infections.

Keywords: *online consultations, healthcare, telehealth, pandemic*

Introduction

The World Health Organisation (WHO) declared coronavirus disease (COVID-19) a public health emergency of international concern (PHEIC) on 30 January 2020. The case fatality rate of COVID-19 varies according to age and co-morbidities (1). In India, nearly 45 million were infected and 0.5 million people died (2). During the pandemic, people hesitated to visit hospitals for consultation, treatment and follow-up. In situations like this, availability of advanced technologies like teleconsultation helps people to continue their access to healthcare and consult doctors for their symptoms and get treated. In spite of the steps taken to reduce the transmission of COVID-19, India saw a rapid increase in the number of cases since the start of the pandemic (2). During the periods of nation-wide lockdown, people had difficulty in accessing healthcare facilities due to the fear of contracting COVID-19 infection. This led to increased recognition of telemedicine services to minimize direct contact with healthcare staff during the pandemic. Realizing the significance of telemedicine, the Government of India revised and published the guidelines on telemedicine practices in the year 2020. The revised guidelines emphasize on fees for teleconsultation, digital records maintenance, medical ethics, privacy and confidentiality (3).

Prior to the pandemic of COVID-19, teleconsultations faced several challenges across the world, including in South Asia. The lack of widespread internet connectivity, especially in rural areas, limited the accessibility of telehealth services. Regulatory frameworks were often inadequate and struggled to keep pace with technological advancements. Additionally, a prevailing scepticism among healthcare professionals and patients hindered the widespread adoption of teleconsultations (4). The pandemic brought about an unprecedented surge in teleconsultations as governments and healthcare systems worldwide sought to minimize in-person interactions to curb the virus's spread. In South Asia, particularly India, the

sudden surge in demand revealed the dual nature of this shift. On one hand, teleconsultations provided a critical solution for continuity of care, especially for non-COVID-19 medical issues, and on the other, it accentuated the existing healthcare disparities, excluding those with no access to smartphones or the internet (5). During the pandemic, teleconsultation services such as 'Calldoc' and 'DR YSR Telemedicine' were initiated for the community to consult doctors. The Delhi Government coordinated such services throughout the day as free teleconsultation services to help the patients connect with doctors for regular health check-ups and consultations (6). Patients can connect to doctors through video/audio/chat and get the consultation over phone by using such mobile applications. Patients can also upload their test reports for doctors to review.

Several studies have found that the quality of teleconsultation services and patients' clinical outcomes following the visits is comparable to those of traditional face-to-face visits (7-9). However, a systematic review has reported that teleconsultation provides a rapid alternative to face-to-face clinical visits (10). It was also noted to be an effective method to evaluate the symptoms of patients, prevent unnecessary visits to the hospital and reduce the waiting time in clinics (10). Teleconsultation is an emerging field in healthcare and has gained a lot of popularity during the COVID-19 pandemic. This field will develop rapidly in the coming years as more people are becoming aware and making use of teleconsultation services. Only a few studies are done in India to understand the patients' perceptions in using teleconsultation and their attitude towards the use of such advanced technology in accessing healthcare. Hence, we conducted this study with the objective of assessing the patients' attitude towards teleconsultation and satisfaction in using teleconsultation during the COVID-19 pandemic in Chennai, South India.

Methods

This cross-sectional study was conducted in the city of Chennai, Tamil Nadu during July-December 2022. The study population included individuals aged 18 years and above, residing in Chennai for at least one year and who have had at least one teleconsultation during the COVID-19 pandemic for themselves or for a family member. Teleconsultation could be through online portals like Practo, through hospitals like Apollo consultation or contacting the physician directly over phone. Those who did not complete the online survey were excluded.

In a study done by Abdel Nasser et al. (2021), about 37% of the participants had experienced satisfactory teleconsultation (7). Considering this as the expected prevalence, a sample size of 400 was calculated at 95% confidence interval (CI) with a margin of error of 5 and 10% non-response. Convenience sampling was used to recruit participants.

After obtaining informed e-consent, data were collected using an online, self-administered questionnaire that was disseminated through various social media platforms. The questionnaire comprised three parts: socio-demographic details of the study participants, their attitude towards teleconsultation and the utilisation of teleconsultation services. The study assessed how patients felt about teleconsultation and how it differed from direct consultations through evaluation of the ease of contact and appointment registration, patient comfort using video consultation, audio and video quality, the ease of describing symptoms to the doctor, patients' comprehension of the doctor's recommendations and the overall standard of medical care delivered via teleconsultation. We also evaluated the participants' attitudes towards the services and their experiences. A Likert scale was used to assess participant satisfaction. For the actual experience in using teleconsultation, we measured the dimensions of healthcare providers such as availability, accessibility, appropriateness and adequacy (11-12). The availability was assessed through the ease or

difficulty in scheduling an appointment and contacting a health care provider without much delay, whereas the accessibility was assessed through various modes of contacting the doctor. The appropriateness and adequacy were assessed through a series of questions on clinical symptoms, ability to convey their complaints, quality of communication, ease in understanding the medical advice and completing the follow-up if advised.

Data analysis

Data were analysed in Epi info software version 7.2. Descriptive statistics were presented in frequencies and percentages. The inferential statistics for categorical data were odds ratio (OR) with 95% CI. A p-value <0.05 was taken to indicate statistical significance. Binary logistic regression model was used to examine factors associated with satisfaction in the quality of healthcare through teleconsultation using adjusted odds ratio (AOR). The dependant variable was overall satisfaction in the utilisation of teleconsultation during the pandemic, while the independent variables were age, sex, education, religion, occupation, monthly family income and type of family.

Results

A total of 405 participants were included in the study. Of them, 61.2% were males and 46% belonged to the age group of 31-45 years. The mean age was 34.6 years. Nearly three-fourths of them belonged to the Hindu religion. Among the respondents, 191 (47.2%) have completed a professional degree or doctorate, while 183 (45%) worked in the professional sector, 83 (20%) in the clerical sector and 66 (16%) in the managerial sector. A minor proportion of the participants belonged to the retired community. More than half of the respondents (54.3%) were living in a nuclear family.

The majority of participants (95.5%) agreed that teleconsultation services paved the way for easy access to healthcare during the pandemic. Nearly

36% (n=145) who had a video consultation said they felt uncomfortable, while 202 (50%) said they were comfortable. About 84 of the study participants

(20.8%) agreed that teleconsultation is preferred because it saves time and money.

Table 1: Use of teleconsultation during COVID-19 pandemic (N=405)

Characteristic	No.	%
Symptoms for which teleconsultation was taken*		
Fever, cough, sore throat	227	56.1
Diabetes, hypertension	88	21.7
Dermatological	42	10.4
Myalgia, arthralgia	110	27.2
Ophthalmic	66	16.3
Pregnancy	32	7.9
Gastro-intestinal	46	11.3
Others	67	16.5
Scheduling an appointment/contacting the doctor was easy		
Yes	375	92.6
No	30	7.4
The quality of audio during teleconsultation		
Highly satisfied	100	24.7
Satisfied	233	57.6
Neutral	22	5.4
Dissatisfied	50	12.3
If it was a video consultation, did you feel comfortable while discussing with the doctor? (n=340)		
Yes	265	65.4
No	75	18.6
The quality of video during teleconsultation (n=340)		
Highly satisfied	43	12.6
Satisfied	211	62.1
Neutral	56	16.5
Dissatisfied	30	8.8
Able to convey your health problems/complaints to the doctor clearly without difficulty		
Yes	393	97.1
No	12	2.9

* Multiple responses

Among the study participants, 332 (82%) were aware of teleconsultation applications available in the region, although teleconsultation platforms had been utilized only by 125 (31%) participants. About 60 (15%) used the online consultation services provided by tertiary care hospitals, while almost 92% have contacted the doctor directly over the phone for teleconsultation. Among the respondents, 130

(32.1%) have utilized teleconsultation services 1-2 times and 252 (62.2%) 3-5 times in a year. Follow-up was advised by doctors for 92.6% of the participants, of whom only 52% completed the follow-up consultation. The symptoms for which the participants tele-consulted, scheduling of appointment, quality of audio and video, and the level of confidentiality are presented in Table 1. In

the sample, 49 participants (12.3%) expressed dissatisfaction with the audio quality during the teleconsultation. When participants were questioned about any technical issues they encountered when using the teleconsultation services, only 12.3% said

they had such difficulties. Only 24 (6%) expressed high satisfaction with the privacy and confidentiality maintained during teleconsultations, compared to 3% who were dissatisfied and 68% who were satisfied.

Table 2: Socio-demographic factors and their association with the satisfaction on healthcare through teleconsultation (N=405)

Variables	Satisfied No. (%)	Not satisfied No. (%)	Odds ratio (95% CI)	χ^2 value	p value
Age (in years)					
>30	217 (58.2)	11 (34.4)	2.6 (1.2, 5.7)	6.8	0.015*
≤ 30	156 (41.8)	21 (65.6)			
Gender					
Male	231 (61.9)	17 (53.1)	1.4 (0.7, 2.9)	0.6	0.4
Female	142 (38.1)	15 (46.9)			
Type of family					
Joint	172 (46.1)	16 (50.0)	0.8 (0.4, 1.8)	0.06	0.8
Nuclear	201 (53.9)	16 (50.0)			
Monthly family income					
≤ Rs. 100 000	155 (41.6)	16 (50.0)	0.7 (0.3, 1.5)	0.8	0.4
> Rs. 100 000	218 (58.4)	16 (50.0)			
Highest education					
Professional and Master's degree	210 (56.3)	18 (56.2)	1.0 (0.4, 2.1)	0	0.9
Others	163 (43.7)	14 (43.8)			

CI=confidence interval; *p<0.05 statistically significant at 95% CI

Satisfaction of the participants on the overall quality of health care offered through teleconsultation was assessed using a 5-point Likert scale, according to which 73 (18%) respondents said they were extremely satisfied, 300 (74%) satisfied, 12 (2.9%) dissatisfied and 18 (4.5%) extremely dissatisfied. Tables 2 and 3 describe the factors associated with satisfaction on the quality of healthcare via teleconsultation. Only age was found to be a significant factor among the sociodemographic characteristics (p=0.015). Among the factors related to attitudes, the general preference for teleconsultation (p=0.04) and the respondents' attitude towards video consultation (p=0.02) were shown to be significant. When adjusted for confounding effects in the regression analysis,

satisfaction with healthcare access through teleconsultation was significantly associated with age >30 years (AOR=4.62; p=0.003) male sex (AOR=0.09; p=0.02) and nuclear type of family (AOR=0.52; p=0.03).

Discussion

With teleconsultation becoming popular due to the COVID-19 pandemic, this study was done to assess the use of teleconsultation during the pandemic. The study results show the overall experience of the participants in using teleconsultation services and their satisfaction in access to healthcare through this approach. Only a few studies have been done on the

patients' use of teleconsultation during the Pandemic in India. Studies have been done in developed countries like the US on telehealth visits in populations such as antenatal and postnatal mothers

where at least 80% reported that they were practical, simple and secure (13). This is not much explored in developing countries even in the general community.

Table 3: Association between participants' attitude and overall satisfaction in Teleconsultation (N=405)

Variable	Satisfied No. (%)	Not satisfied No. (%)	Odds ratio (95% CI)	χ^2 value	p value
Teleconsultation makes access to healthcare easy					
Agree	358 (96.0)	29 (90.6)	2.5 (0.7, 9.0)	0.93	0.3
Disagree/not sure	15 (4.0)	3 (9.4)			
Teleconsultation saves time and money					
Yes	71 (19.1)	13 (40.6)	0.3 (0.2, 0.7)	8.3	0.003*
No/not sure	302 (80.9)	19 (59.4)			
Attitude towards video consultation					
Yes	194 (52.1)	9 (28.1)	2.8 (1.2, 6.1)	5.8	0.02*
No	179 (47.9)	23 (71.9)			

CI=confidence interval; *p<0.05 statistically significant at 95% CI

Table 4: Binary logistic regression analysis

Independent variables	Adjusted odds ratio (95% CI)	Significance
Age	4.62 (2.63, 8.76)	0.003*
Gender	0.09 (0.01, 0.33)	0.02*
Education	0.19 (0.01, 1.02)	0.14
Income	2.21 (0.85, 3.87)	0.16
Type of family	0.52 (0.27, 0.85)	0.03*

CI=confidence interval; *p<0.05 statistically significant at 95% CI

Patient satisfaction is the most valid outcome to evaluate the quality of teleconsultation (14). Although majority of participants in our study were satisfied with teleconsultation services, but when asked to choose between tele and direct consultations for future, they preferred direct consultations. Almost 92% were satisfied with teleconsultation services provided by the health care provider which is similar to the finding of Orrange S et al. (2021), where 83% were satisfied (15). Another study showed that 97.6% of the participants were satisfied with teleconsultation (16). Nikita Pandey et al. (2020) reported the feasibility of tele-ophthalmology in a tertiary care centre in North India and around 60% did not require direct physical examination. The authors reported that teleconsultation was feasible

for provision of ophthalmic services during the lockdown (17). In a study by Luna et al. (2022), the majority of patients were content with the ease of contact, video quality and the guidance provided by doctors. The authors suggested that the standard of telehealth delivery platforms and patient instructions should be raised in order to maintain interest in future telehealth use and enhance the patient experience (18). In a similar study done by Alromaihi et al. (2023), evaluation of patient satisfaction to teleconsultation services showed that around 89% of the patients were satisfied with the quality of teleconsultation (19). In contrast, Verhaeghe et al. (2022) in ascertaining whether telemedicine is appropriate for clinical assessment of acute respiratory infections like COVID-19 reported

discrepancies between remote and in-person consultations for primary clinical symptoms of COVID-19 (20). The discrepancies noted in the comparison of clinical signs between teleconsultation and traditional consultation were cough 103 (69.1%) vs. 24 (16.1%); fever 70 (47.0%) vs. 23 (15.4%); and flu-like illness 79 (53.0%) vs. 11 (7.4%).

With high dependence on internet and mobile phone, technical glitches are likely during teleconsultation. Only 12.3% and 8.8% were dissatisfied with the quality of audio and video respectively in this study. This finding is similar to a study where only 3% and 8% had issues with audio and video respectively (16). The convenience of teleconsultation comes with its own merits and demerits. With good connectivity, teleconsultation can save a lot of time and money spent for transportation, waiting time in the clinic and work absenteeism. For minor illnesses, people can make use of the teleconsultation facility and get medical advice from doctors. Similarly, for follow-up of chronic diseases like diabetes, hypertension without complications, teleconsultations will be beneficial for both patients and doctors. The patient load and waiting time in the outpatient clinics will be reduced. With increasing shortage of medical practitioners especially the specialists, the use of teleconsultation paves way for quick access to the concerned professionals (21). Barkai et al. in their study noted that despite the technical and administrative challenges that some patients faced, the overall satisfaction rate was high. They concluded that the success of a teleconsultation project relies on an intuitive, integrated platform and a smooth administrative process (22).

With choice given, 90% of study participants preferred direct consultation over teleconsultation which contradicts with the study findings of Orange S et al. (2021) where 77% were looking forward to teleconsultation in future and Bhuva S et al. (2020) where 64.5% preferred teleconsultation over in-person appointments (15-16). A study comparing

direct and teleconsultations showed that 45% of respondents selected teleconsultation, while 34% selected direct visit and 21% found no difference between the visit type (23). Similarly in a study by Byrne & Watkinson (2021), results showed that the majority of patients are more interested in virtual appointments in the future as opposed to in-person, since it is more convenient for them (24). Awareness has to be created in the community regarding the use and merits of teleconsultation. With advances in technology and increasing population literacy, people can opt for such services for better access to healthcare (25). Health education programmes can also be conducted through mass media and social media regarding the availability of teleconsultation platforms and how to access them.

In a multi-centre study conducted in India, the authors report that despite the fact that the majority of healthcare practitioners have promptly shifted to telephone and video consultations to stay in touch with their patients, their study findings revealed that people do not believe the treatment they received after lockdown was any more suitable than it was before. This necessitates a significant shift in how clinical personnel and patients see coping with these unpredictable times (26). In a review on digital health solutions by Haregu et al. (2023), one of the difficulties in implementing digital health solutions in low- and middle-income nations was the lack of access to dependable internet connectivity and the lack of readiness for the adoption of virtual services (27). The deployment of digital health solutions may worsen inequities in healthcare access for disadvantaged groups with poor digital literacy or access to the internet and digital devices even though they increased access to care and continuity of care. This must also be considered while developing and executing telehealth programmes (28). According to a report on teleconsultation in public health emergencies like the COVID-19 pandemic, teleconsultation services can assist in providing prevention guidelines, dispelling myths, identifying risk categories and quickly directing people to the

right services and facilities (29). Similarly, training of healthcare professionals is also much needed as they should be oriented towards the use of teleconsultation and the advantages to them as a healthcare provider.

Teleconsultation will be of great help to treat patients with mild symptoms, get second opinion for complicated cases and facilitate prompt access to decision making in healthcare (30). In the present study, 97% of the participants were able to convey their symptoms or complaints to the doctor without much difficulty. Similar results were noted in a study by Abdel Nasser et al. (2021) done on patient satisfaction and attitude towards teleconsultation (7). Many countries have implemented teleconsultation services during COVID-19 pandemic and these services definitely played a major role in continuing access to healthcare and limiting the hospital visits (31-32).

Our study has certain limitations as the data was collected through online platforms and non-probability sampling method was used to recruit participants into the study. Due to this, the study

participants may not be representative of the population in Chennai. More research is needed in future with robust methodology and a larger sample size.

Conclusions & Recommendations

This study was conducted to assess the patients' satisfaction in accessing healthcare through teleconsultation. Though 92% were satisfied with the quality of care offered through teleconsultation, majority of the study participants prefer direct consultation of health care providers. Teleconsultation provides an alternative platform for provision of healthcare during emergency situations like the ongoing pandemic. With advances in technology, teleconsultation platforms can be popularized in the community. People can access healthcare through teleconsultation for minor illnesses and regular follow up of chronic diseases. Health awareness programmes should focus on increasing the understanding of the community on availability of teleconsultation services, when and how they can be accessed.

Public Health Implications

- One of the most immediate public health benefits of teleconsultation during the pandemic has been its ability to reduce the risk of virus transmission.
- By allowing patients to consult with healthcare providers from the safety of their homes, it minimizes unnecessary exposure to crowded healthcare facilities.
- This not only protects vulnerable individuals but also helps prevent overwhelming healthcare systems, ensuring that resources are available for those who need them most.

Author Declarations

Competing interests: None declared.

Ethics approval and consent to participate: The study was conducted after obtaining approval from the Institutional Ethical Committee (Reference No. 002/SBMC/IHEC/2021/1603). Informed e-consent was obtained from the study participants. The Declaration of Helsinki's principles for conducting biomedical research with human beings were followed during the study's execution.

Funding: Self-funded.

Acknowledgements: We thank the respondents for sparing their valuable time to participate in the study. We also express our sincere thanks to the College Management and other faculty members of our department for their support in conducting this study.

Author contributions: AG conceptualized and designed

the study; AG and SN were involved in data collection and drafting the manuscript; RG and UR analysed the data and supervised the project. SP aided in interpreting the results. All authors contributed to the final manuscript.

References

1. World Health Organisation. *Coronavirus disease (COVID-19)*. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>.
2. World Health Organisation. *Coronavirus Disease (COVID-19) Situation Reports*. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>.
3. Ministry of Health and Family Welfare. *Telemedicine: Practice Guidelines enabling Registered Medical Practitioners to provide Healthcare using Telemedicine*. India, 2020, 1-48. Available from: <https://www.mohfw.gov.in/pdf/Telemedicine.pdf>.
4. Bhaskar S, Bradley S, Chattu VK, Adishes A, Nurtazina A, Kyrykbayeva S, et al. Telemedicine Across the Globe-Position Paper From the COVID-19 Pandemic Health System Resilience PROGRAM (REPROGRAM) International Consortium (Part 1). *Front Public Health* 2020; 8: 556720. <https://doi.org/10.3389/fpubh.2020.556720>.
5. Rajkumar E, Gopi A, Joshi A, Thomas AE, Arunima NM, Ramya GS, et al. Applications, benefits and challenges of telehealth in India during COVID-19 pandemic and beyond: a systematic review. *BMC Health Serv Res* 2023; 23(1): 7. <https://doi.org/10.1186/s12913-022-08970-8>.
6. Garg S, Gangadharan N, Bhatnagar N, Singh MM, Raina SK, Galwankar S. Telemedicine: Embracing virtual care during COVID-19 pandemic. *J Fam Med Prim Care* 2020; 9(9): 4516-4520. https://doi.org/10.4103/jfmmpc.jfmmpc_918_20.
7. Abdel Nasser A, Mohammed Alzahrani R, Aziz Fellah C, et al. Measuring the Patients' satisfaction about telemedicine used in Saudi Arabia during COVID-19 pandemic. *Cureus* 2021; 13(2): e13382. <https://doi.org/10.7759/cureus.13382>.
8. Polinski JM, Barker T, Gagliano N, Sussman A, Brennan TA, Shrank WH. Patients' satisfaction with and preference for telehealth visits. *J Gen Intern Med* 2016; 31: 269-275. <https://doi.org/10.1007/s11606-015-3489-x>.
9. Alharbi KG, Aldosari MN, Alhassan AM, Alshallal KA, Altamimi AM, Altulaihi BA. Patient satisfaction with virtual clinic during coronavirus disease (COVID-19) pandemic in primary healthcare, Riyadh, Saudi Arabia. *J Fam Community Med* 2021; 28(1): 48-54. https://doi.org/10.4103/jfcm.JFCM_353_20.
10. Downes MJ, Mervin MC, Byrnes JM, Scuffham PA. Telephone consultations for general practice: a systematic review. *Syst Rev* 2017; 6: 128. <https://doi.org/10.1186/s13643-017-0529-0>.
11. Wyszewianski L. Access to care: remembering old lessons. *Health Serv Res* 2002; 37(6): 1441-1443. <https://doi.org/10.1111/1475-6773.12171>.
12. Levesque JF, Harris MF, Russell G. Patient-centred access to health care: conceptualising access at the interface of health systems and populations. *Int J Equity Health* 2013; 12: 18. <https://doi.org/10.1186/1475-9276-12-18>.
13. Marshall C, Gutierrez S, Hecht H, Logan R, Kerns J, Diamond-Smith N. Quality of prenatal and postpartum telehealth visits during COVID-19 and preferences for future care. *AJOG Glob Rep* 2023; 3(1): 100139. <https://doi.org/10.1016/j.xagr.2022.100139>.
14. Ramaswamy A, Yu M, Drangsholt S, Ng E, Culligan PJ, Schlegel PN, Hu JC. Patient satisfaction with telemedicine during the COVID-19 pandemic: retrospective cohort study. *J Med Internet Res* 2020; 22(9): e20786. <https://doi.org/10.2196/20786>.
15. Orrange S, Patel A, Mack WJ, Cassetta J. Patient satisfaction and trust in telemedicine during the COVID-19 pandemic: retrospective observational study. *JMIR Hum Factors* 2021; 8(2): e28589. <https://doi.org/10.2196/28589>.
16. Bhuva S, Lankford C, Patel N, Haddas R.

- Implementation and patient satisfaction of telemedicine in spine physical medicine and rehabilitation patients during the COVID-19 shutdown. *Am J Phys Med Rehabil* 2020; 99(12): 1079-1085.
<https://doi.org/10.1097/PHM.0000000000001600>.
17. Pandey N, Srivastava RM, Kumar G, Katiyar V, Agrawal S. Teleconsultation at a tertiary care government medical university during COVID-19 Lockdown in India – A pilot study. *Indian J Ophthalmol* 2020; 68: 1381-1384.
https://doi.org/10.4103/ijo.IJO_1658_20.
 18. Luna P, Lee M, Vergara Greeno R, DeLucia N, London Y, Hoffman P, et al. Telehealth care before and during COVID-19: trends and quality in a large health system. *JAMIA Open* 2022; 5(4): ooac079.
<https://doi.org/10.1093/jamiaopen/ooac079>.
 19. Alromaihi D, Asheer S, Hasan M, Faqih F, Almannai N, Alkowiari S, et al. Evaluation of Patients' satisfaction with the transition of internal medicine outpatient clinics to teleconsultation during COVID-19 pandemic. *Telemed J E-Health* 2023; 29(2): 270-277.
<https://doi.org/10.1089/tmj.2021.0517>.
 20. Verhaeghe H, Chellum N, Tressières B, Ouissa R, Roger PM. Teleconsultation in family medicine amid the COVID-19 pandemic: an adequate tool? *Infect Dis Now* 2022; 52(4): 230-232.
<https://doi.org/10.1016/j.idnow.2022.05.004>.
 21. Mittal A, Singh AP, Sureka B, Singh K, Pareek P, Misra S. Telemedicine during COVID-19 crisis in resource poor districts near Indo-Pak border of western Rajasthan. *J Fam Med Prim Care* 2020; 9(7): 3789-3790.
https://doi.org/10.4103/jfmpe.jfmpe_1041_20.
 22. Barkai G, Gadot M, Amir H, Menashe M, Shvimer-Rothschild L, Zimlichman E. Patient and clinician experience with a rapidly implemented large-scale video consultation program during COVID-19. *Int J Qual Health Care* 2021; 33(1): 165. <https://doi.org/10.1093/intqhc/mzaa165>.
 23. Shaverdian N, Gillespie EF, Cha E, Kim SY, Benvenuto S, Chino F, et al. Impact of telemedicine on patient satisfaction and perceptions of care quality in radiation oncology. *J Natl Compr Canc Netw* 2021; 19(10): 1174-1180. <https://doi.org/10.6004/jnccn.2020.7687>.
 24. Byrne E & Watkinson S. Patient and clinician satisfaction with video consultations during the COVID-19 pandemic: an opportunity for a new way of working. *J Orthod* 2021; 48(1): 64-73.
<https://doi.org/10.1177/1465312520973677>.
 25. Hollander JE & Carr BG. Virtually perfect? telemedicine for COVID-19. *N Engl J Med* 2020: 1-3. <https://doi.org/10.1056/NEJMp2003539>.
 26. Raman R, Rajalakshmi R, Surya J, Ramakrishnan R, Sivaprasad S, Conroy D, et al. Impact on health and provision of healthcare services during the COVID-19 lockdown in India: a multicentre cross-sectional study. *BMJ Open* 2021; 11(1): e043590. <https://doi.org/10.1136/bmjopen-2020-043590>.
 27. Haregu T, Delobelle P, Issaka A, Shrestha A, Panniyammakal J, Thankappan KR, et al. Digital health solutions for community-based control of diabetes during COVID-19 pandemic: a scoping review of implementation outcomes. *J Diabetes Sci Technol* 2023; 19322968231167853.
<https://doi.org/10.1177/19322968231167853>.
 28. Hsueh L, Huang J, Millman AK, Gopalan A, Parikh RK, Teran S, et al. Disparities in use of video telemedicine among patients with limited English proficiency during the COVID-19 pandemic. *JAMA Netw Open* 2021; 4(11): e2133129.
<https://doi.org/10.1001/jamanetworkopen.2021.33129>.
 29. Khatun F, Ahmed NU, Rahman H, Roy SS, Chowdhury SA, Chowdhury R, et al. The promise of teleconsultation in the era of pandemic: a case from Bangladesh. *Telemed J E-Health* 2023; 29(4): 602-606.
<https://doi.org/10.1089/tmj.2021.0529>.
 30. Monaghesh E & Hajizadeh A. The role of telehealth during COVID-19 outbreak: a systematic review based on current evidence. *BMC Public Health* 2020; 20(1): 1193.
<https://doi.org/10.1186/s12889-020-09301-4>.

31. Calton B, Abedini N, Fratkin M. Telemedicine in the time of coronavirus. *J Pain Symptom Manage* 2020; 60: 12-14.
<https://doi.org/10.1016/j.jpainsymman.2020.03.019>.

32. Fisk M, Livingstone A, Pit SW. Telehealth in the context of COVID-19: changing perspectives in Australia, the United Kingdom and the United States. *J Med Internet Res* 2020; 22: e19264.
<https://doi.org/10.2196/19264>.