



Usability of Telemedicine among Patients as a Tool of Medical Care During the Covid-19 Pandemic

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ABSTRACT

The Covid 19 pandemic is an unprecedented event that has led to an abrupt and drastic shift in medical practice worldwide. It has led to a boom in telemedicine consultation/visits. This paper aims to assess telemedicine's usability among patients of the tertiary health care center in Kerala. Only a few articles are assessing the usability of telemedicine services, especially in south India, making our study relevant in these times.

Materials and methods - All patients of a tertiary health care center who had a telemedicine consultation were identified and contacted using WhatsApp, email, or phone call. The usability of telemedicine among patients was assessed using a questionnaire adapted from the Telemedicine Usability Questionnaire (TUQ). The questionnaire was administered to the participants through WhatsApp or email.

Results - The total number of respondents was 183, and the response rate was 61.33%. We identified the various rates of agreeability among the patients on the factors of usability of telemedicine. These are usefulness, ease of use, learnability, interaction quality, satisfaction, and future use. 84% of respondents were satisfied with telemedicine usage. 84.7% of them agreed to use telemedicine again.

Conclusion - Usability among the patients was high and has a very positive response. Most patients were willing to continue using telemedicine as a model of medical care. They felt empowered and it also had an economic advantage to them. More knowledge and understanding of this method will keep us prepared for any such natural or manmade disasters in the future and allow for constructive additions to our traditional healthcare system.

Keywords: covid pandemic, health care, hospital visit, telehealth, telemedicine, satisfaction, usability

INTRODUCTION

This face of severe acute respiratory syndrome coronavirus 2 (SARS Cov 2) pandemic has led to many forced changes in how situations were approached earlier and has had a rather drastic hit on in-person healthcare care, far from possible in this situation. [1],[2]. In general, patients find themselves more comfortable with hospital visits, walking into the doctor's office, explaining their discomfort,

getting individual care, attention, treatment, and interaction with the hospital staff. In the wake of the current scenario, the seemingly uncomplicated nature of events following a visit to the doctors has had to take a different turn. The Indian government has proactively taken multiple steps to slow down disease progression, including converting some hospitals to covid 19 centers and shutting down many routine

hospital services, including outpatient services and elective OTs, while emergency services have continued. [2] Most patients face a predicament of the high risk of catching an infection from the hospital and denying quality healthcare because of such situations [1].

Therefore, Covid 19 has necessitated a digital revolution. Despite telemedicine having existed for decades, its implementation has not been forthcoming. Rapid use of telemedicine has been an inadvertent fall out because of Covid-19 [3], and now it is transforming at a breathtaking speed [4]. With the Greek prefix "tele," meaning far, telemedicine means 'healing from a distance' [5]. One of the many definitions of telemedicine adopted by the World Health Organization is "The delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for the diagnosis, treatment, and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities" [6]. It is defined by the American Telemedicine Association as "the use of medical information exchanged from one site to another via electronic communications to improve a patient's clinical health status" [5].

Telemedicine was considered a healthcare delivery method to the rural and more underprivileged parts of the society who faced difficulty attaining excellent healthcare [7]. Nevertheless, it has posed a welcoming change in preventing the spread of infections within the hospital. Expanding access to care, reducing disease exposure for staff and patients, preserving the scarce supply of personal protective equipment, and reducing patient demand on facilities, are various other advantages posed by this system [8][9]. A practical benefit of using online medical care is that many doctors who have had to stay away from hospitals during this time, either due to being infected or being immunocompromised, can continue providing medical assistance. [3] Most practitioners are concerned about user satisfaction due to some general limitations of telehealth services like technological difficulties that arise while using computers, tablets, or smartphones, and sometimes patients do not have access to the necessary

infrastructure (high-speed internet or video-enabled devices to participate in telemedicine [10]

Now, it has become clear that the Covid-19 pandemic will have long-lasting consequences on traditional health care systems. The pandemic also allows the medical fraternity to optimize health care services. With our study, we intend to assess the usability of telemedicine during Covid-19. The usability of telemedicine refers to the intention to which a service can be used to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context [11]. It is a critical determinant of telemedicine acceptance, use, and has been identified as an enabler of successful healthcare, which reduces the burden on patients and clinicians [11].

MATERIALS AND METHODS

The Institutional Research Board (IRB) approved this study after a brief presentation of the study proposal.

Study type and setting

Ours was a cross-sectional study undertaken on patients who had used telemedicine as a mode of consultation for their treatment from tertiary care hospitals in South India.

Study Tools and Data collection

Tool: Questionnaire

The questionnaire used in the study was adapted from 2 standard questionnaires, which were variations of the TUQ (Telehealth Usability Questionnaire) on telemedicine. For validation, we conducted a pilot study with 10 participants of our study population, and we made changes accordingly before further data collection.

The questionnaire consists of socio-demographic questions and questions based on the usability of telemedicine during Covid-19. The questionnaire had two parts.

The first part consists of 6 questions to assess telemedicine usage, and the second part consists of 14 questions that were 5-point Likert-type rating scale of Strongly Agree to Disagree Strongly. These questions were grouped based on usefulness and ease of use, interaction quality, and satisfaction and future use.

We formatted the questionnaire in two languages, English and the regional language, Malayalam, to make it easier to understand the questions. Informed consent was attached along with the questionnaire, and Patients were assured that their identity would remain anonymous.

Data collection was done by sending the questionnaire as google forms to the patients via different social media platforms (Email or WhatsApp). We sent the questionnaire to 300 patients, out of which 183 responded (response rate= 61.33%), and the obtained data were analyzed via SPSS.

Sample Size

Based on the reference study "Evaluation of patient and doctor perception towards the use of telemedicine in Apollo telehealth services, India," 80% of the patients reported their satisfaction with the quality of treatment given through telemedicine with 10% allowable error and 95% confidence interval, the minimum sample size comes to 100 for our study.

The study sample consisted of patients of all age groups who took consultation via telemedicine in different tertiary health care hospitals of South India. On distributing the questionnaire, we obtained the data of 183 responses.

Statistical Analysis

The modified TUQ questionnaire was split into three categories, usefulness, and ease of use, interaction quality, and satisfaction and future use. Each question would be answered based on a 5-point Likert scale ranging from strongly agree to disagree strongly.

Data were analyzed in terms of frequencies and percentages using SPSS version software.

RESULT

In total, 183 patients completed the questionnaire and Out of that, 103 of the respondents were females, and 80 respondents were males. Table no :1 gives the percentage of responses from a different department.

The results showed that 157 respondents (85 .8%) were using telemedicine for the first time.

According to the results, only 44 respondents (24%) had previous knowledge about telemedicine as a

mode of online consultation, and 54% of the respondents got information regarding telemedicine consultation from hospitals.

About half of the respondents (56.3%) preferred zoom meetings as a model of telemedicine consultation over WhatsApp (24%), hospital-based app (14.2 %), phone calls (3.3%), and other methods (2.2%).

About 39.9% of respondents used telemedicine consultation thrice a month, and 20.2% used 6-monthly, 19.7% monthly, and 14.2% of respondents used it once a year.

On usability, the results showed that 56.3% of respondents strongly agreed and 36.6% agreed that telemedicine improves their access to health care services, while 7.1% neither agree nor disagree with the statement.

65%of the respondents strongly agreed, and 27.3% agreed that telemedicine saves their time traveling to hospitals, whereas 7.7% neither agree nor disagree with the statement.

43.2% of respondents strongly agreed, and 35 % agreed that telemedicine provides for their health care needs, while 13.1% of respondents neither agree nor disagree, 7.7% disagreed, and only 1.1% strongly disagreed with the statement.

Regarding the ease of use and learnability, 49.2% of respondents strongly agreed, and 37.2% agreed that it was easy to learn to use the system, while 10.4% neither agree nor disagree, 2.7% disagreed, and only 0.5% showed strong disagreement.

The three statements regarding the interaction quality, along with the corresponding responses, are shown in Table 2.

Graph 1 gives the responses received from patients on comparing telemedicine and hospital visits.

Questions related to satisfaction and future use of telemedicine are observed and compiled in table 3.

DISCUSSION

People's experience and opinion while using a new health care system like telemedicine varies from time to time and from person to person. Therefore, the assessment of the perception of patients towards telemedicine during the Covid 19 pandemic is essential. Moreover, surveys assessing patients'

perception towards telemedicine enable healthcare providers to ascertain whether they are meeting patients' expectations and needs and expose areas that require improvement towards set standards. Evaluation of the user's view on telemedicine paves the way for improvements. With this study, we tried to explore the patients' viewpoint regarding the usability of telemedicine.

We also observed that even though telemedicine was an established form of medical consultation, patients only resorted to this method mainly during the pandemic, most probably due to the lack of other alternatives. From many studies done during this period, it is safe to assume that the number of people using telemedicine has drastically increased because of the strengthening of existing telemedicine facilities in hospitals (including governmental and non-governmental) and less preference of hospital consultation by the patient due to extensive fear of getting infected in a high-risk environment.

157 of our respondents were first-time users of telemedicine, and 54% of them were informed about this mode of consultation through the hospital that they usually consult at. 24% had previous knowledge about it, and their friends and families assisted 14.8%, and a small percentage of 7.1 came to know via social media announcements.

This shows the importance of the hospital and health care system in updating the public with newer and viable ways to receive medical services like telemedicine to rural and urban parts of the land, especially during difficult times like the pandemic.

Seventy-three respondents consulted the doctor once in 3 months, and 26 respondents required consultation once a year. This conveyed that most of our respondents underwent routine medical check-ups and not those who needed emergency medical attention. Thus, the waiting period and other online consultation delays did not affect their disease badly, which may have positively contributed to the observed high satisfaction rates.

Here, we try to assess the usability of telemedicine services that comprise the following factors, usefulness, ease of use and learnability, interaction quality, satisfaction, and future use.

Usefulness, ease of use, and learnability

Usefulness refers to the viewpoint of the users regarding healthcare services provided by the telehealth system [12]

The ease of usability and learning to adapt to this new online healthcare method was well-received by all ages of patients from our study population. Time, which is an essential factor in everyday life, is significantly saved while using this system. We can save traveling time and unnecessary back and forth travel to the hospitals, impacting patients' health. A study done in Korea showed that one of the strengths of telemedicine is that it saves time [11] They can also steer clear of the travel expenses and accommodation arrangements that need to be near the hospitals. Apart from the questionnaire used, patients who interacted with us, especially the women and the elderly, conveyed that they feel independent and emotionally strong. They did not depend on others for their travel needs and other requirements for a hospital visit.

Interaction quality

The quality of audio and video interaction of the patient with the clinician and the extent of similarity of telehealth consultation over in-person interaction is assessed [12].

The interaction quality was generally rated to be clear, and patients could express their concerns effectively, indicating that patients were able to communicate with their doctors just as effectively as they would have in a hospital.

Only 4.3% of the respondents felt that they had difficulty in hearing or understanding the clinician well. Device malfunction, unstable network connection, and patients with hearing disabilities are the possible reasons for the same. There was a minimal hindrance in understanding the doctor and receiving the expected treatment plan, even when both the patient and the doctor were not physically present.

Nevertheless, the lack of physical examination proved to be a setback to 61.2% of patients who might have preferred proper physical examination by a trained medical professional.

Satisfaction and Future Use

It refers to the extent to which the patient is content with telehealth systems' healthcare services. 46% of

our respondents found the quality of care through telemedicine to be highly satisfactory and was perceived neutrally by 27.9% of our respondents. The neutral response must be because most of our participants had used telemedicine for the first time and may not have been immediately comfortable with its usage.

Additionally, respondents mentioned that they were comfortable using telemedicine to attain medical attention especially when they were from the doctors who used to treat them earlier as well. The above also suggested that there were minimal language barriers, and since their relationship with the doctors was defined, the new method did not feel too intimidating to those individuals.

1. Process chart in hospital visits: Flow chart 1 [13]
2. Telemedicine process: Flow chart 2 [14]

Telehealth comprises phone, video, internet, and technology to provide healthcare services and can be made just as effective as in-person care when done in the right way [15].

Patient privacy, doctor-patient relationship, physical examination, and quality of care delivered are the four features that we have used to assess patients' impression of telemedical care during the pandemic.

58.5% of the patients felt that their privacy was more protected in hospital visits than through online consultations. Fear of leakage of private data, they have been uncomfortable because of there being staff other than the doctor during the consultation are the possible reasons for the above. The general stigma of being labeled with an illness is feared by many in our community. Thus, being present with the doctor reassures the patient that doctor-patient confidentiality will prevail.

78.2% of patients perceived that the doctor-patient relationship is stronger in hospital visits. In general, patients tend to get more comfortable and open to a doctor once the doctor has conducted a general examination of the patient. Physical examination during hospital visits has a positive impact on doctor-patient relationships and building more trust among patients.

In a previous study done by Carr-Hill, the telehealth system was satisfactory for more than 80% of its users

[9]. Similarly, our study showed the overall satisfaction of this system to be 82%.

Since this method of providing medical attention is known worldwide, the prevalence of telemedicine will increase substantially, even post the pandemic. So, training and education in telemedicine will need to be augmented at all levels of medical education [14].

LIMITATIONS

As ours was a cross-sectional study, most of our respondents were first-time users of telemedicine. We have not been able to identify their satisfaction rates over time, which will give us a positive bias for satisfaction.

Our study population consisted mainly of patients who consult at tertiary health care centers, so a positive bias can be expected due to up to the mark treatment that will be maintained by the hospitals.

CONCLUSION

Telemedicine is recognized as a welcoming and accessible form of healthcare for all ages and genders.

The pandemic paved the way for this method of healthcare to be known to all and accepted.

The health care sector is searching for ways to refine and improve the patient's experience. The growing area of telemedicine shows excellent signs of advancement in keeping up with its users' preferences and the changing environment.

With innovative features and increased functionality that incorporates physician feedback, these tools will increasingly be a viable option for more healthcare appointments long after the pandemic subsides. Our study also identified that patients are glad to use telemedicine again, and the general satisfaction of quality and usability was rated positively. While retaining admirable aspects of traditional care, with virtual care, it is possible to bring out the finest model of healthcare to both our providers and receivers [16]. With more understanding of telehealth care among its providers, we can be more prepared to face any such disasters, man-made or natural in the future and allow for constructive incorporation into traditional healthcare.

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FIGURES AND TABLES

a) Table 1: Response distribution among departments that offer Telemedical support.

Departments Consulted	Percent
General medicine	25.1
Nephrology	13.1
Cardiology	13.7
Neurology	27.3
Psychiatry	8.2
Pulmonology	1.6
Endocrinology	1.1
Rheumatology	1.1
General surgery	1.1
GI Surgery	1.1
Oncology	1.6
ENT	2.2
Obstetrics/ Gynecology	1.6
Orthopedics	.5
Dermatology	.5
Total	100.0

b) Table 2- Interaction quality

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I could clearly	49.7%	36.6%	9.3%	3.8%	0.5%

hear the clinician using this system.					
I felt I could express myself effectively.	43.2%	37.7%	10.4%	7.1%	1.6%
The doctor explained my care plan well.	52.5%	34.4%	10.4%	2.7%	0%

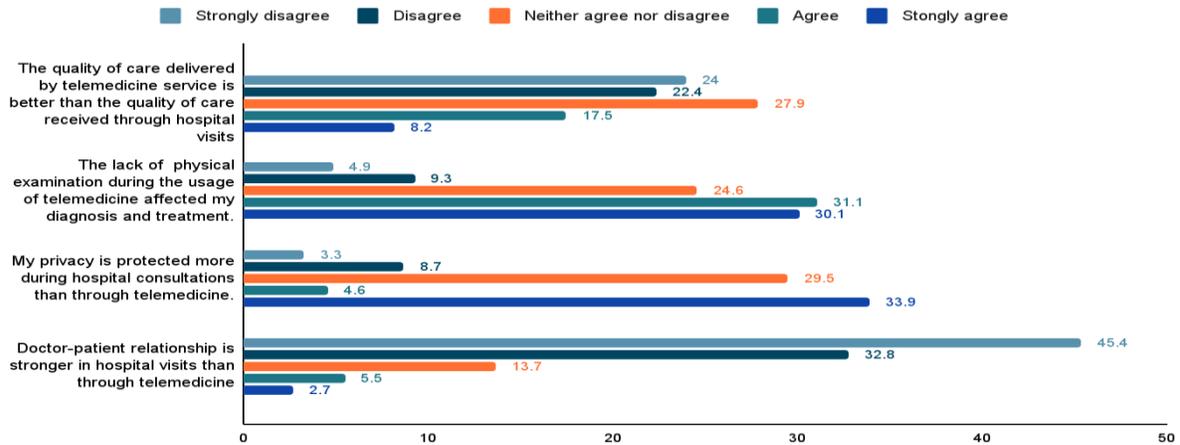
c) Table 3: Patient satisfaction and future use

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
It is an acceptable way to receive health care services.	43.7%	39.3%	12.6%	3.8%	0.5%
I would use telemedicine again	50.8%	33.9%	10.9%	3.3%	1.1%
Overall, I am satisfied with telemedicine for my healthcare	47%	35%	11.5%	5.5%	1.1%

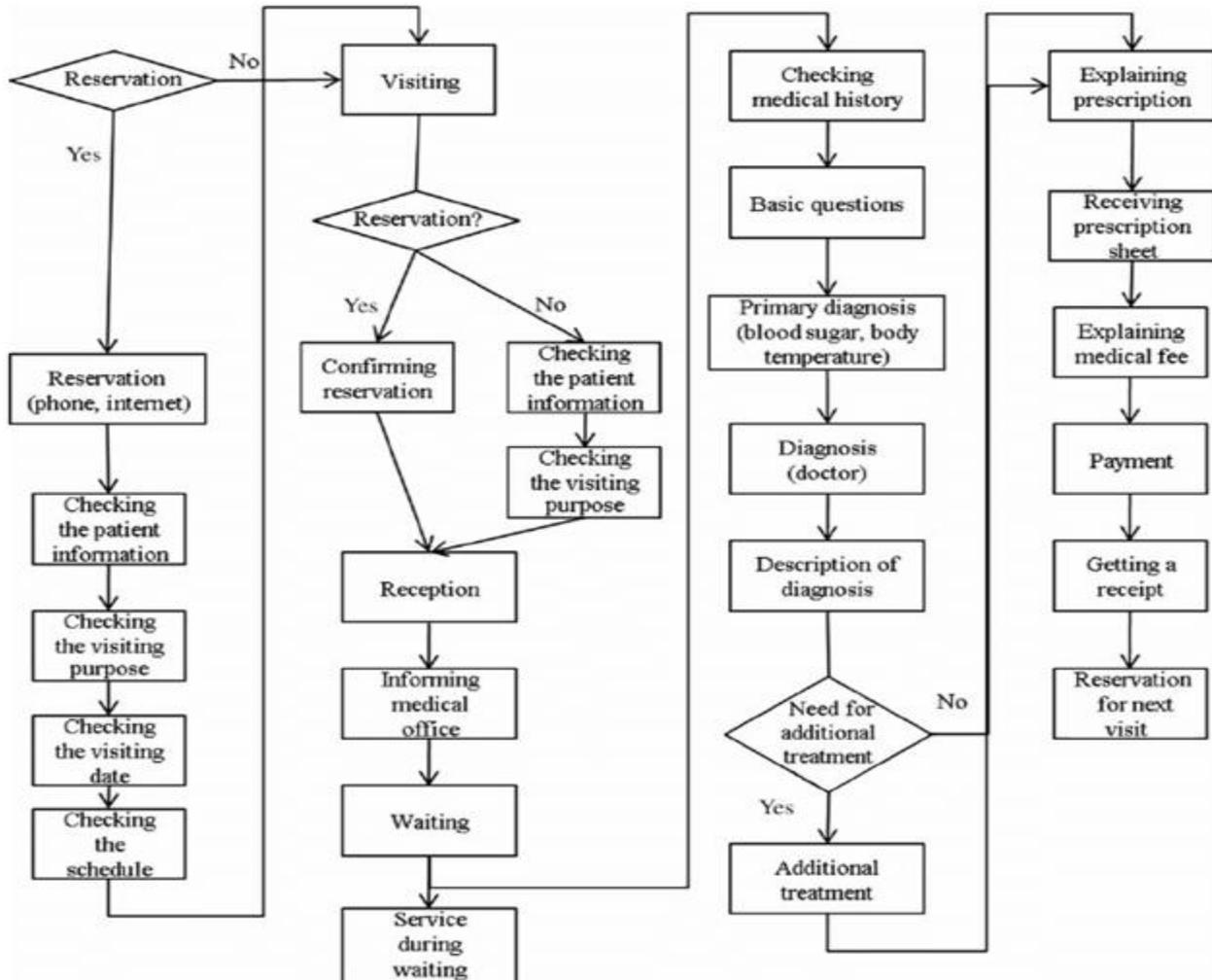
d) Graph 1: Comparison between telemedicine and hospital visits

Patients' perspective- Comparison between telemedicine and hospital visit

In percentage



e) Process chart in hospital visits: Flow chart 1 [13]



f) Telemedicine process: Flow chart 2 [14]

