Views and Perceptions on Telemedicine by consumers in Delhi, India.

Abstract

Telemedicine, also known as telehealth, has been around for decades, but despite its many perceived benefits, adoption has remained low. The objective of the study was to know how patients felt about telemedicine during COVID -19. To find out what factors influence patients' perceptions of Telemedicine services, a survey was done using a questionnaire that included demographic questions as well as 21 questions based on various perception criteria. A chosen sample of people took part in this study. Social media and e-mail were used to inform people about the research. An e online survey was done from the period of April 1st to June 30th, 2021 in India's capital Delhi and adjoining areas, 122 service users were sampled for the survey. A 10-item scale was used to assess telemedicine satisfaction, revealing that all participants were satisfied with their telemedicine experience(s) in general. The elements of perception were studied using factor analysis. Patients are typically comfortable with telemedicine, according to the study; however, users, both doctors, and patients will need to adapt to the same to benefit from the same. The results of the analysis revealed that an individual's intention to utilize a system or technology may be influenced not only by factors affecting the user's direct encounter with the system or technology but also by factors affecting the service provider. Patients place a high value on these qualities, thus service providers can design their interface, appointment procedure, and consultation process around them.

Keywords: Telemedicine, Perceptions, Medicine, healthcare, India

1.1 Introduction

Telemedicine is one field that has succeeded in invoking the business sector's attention and encouraging them to participate actively in public health management [1]. Patients' perception of care quality refers to patients' view of services received and the results of the treatment and are monitored to assess the delivery and quality of healthcare, while patient experiences are a reflection of what happened during the caregiving process. Improving the quality of health care delivery initiatives is to ensure patient safety, improve clinical effectiveness, and promote public accountability.

However, there has never been a global epidemic of this magnitude since the invention of telemedicine that has prompted widespread usage of these services.

Many health care providers are exclusively seeing patients via telemedicine as a result of the pandemic [2]. However, the current COVID-19 pandemic has put telemedicine into the spotlight, particularly in a country like India which is densely populated and has a low number of medical practitioners.

It is a tool that makes healthcare more accessible, cost-effective, and increases patient engagement. Physicians and patients can share information in real-time from one computer screen to another. And they can even see and capture readings from medical devices at a faraway location. Using telemedicine software, patients can see a doctor for diagnosis and treatment without having to wait for an appointment. Patients can consult a physician in the comfort of their homes.

The World Health Organization (WHO) recommends a doctor-to-population ratio of 1:1000. According to the country's population estimate of 135 crore people, there was one doctor for every 1,445 people, which was lower than the WHO's recommended ratio of one doctor for 1,000 people. A total of 11,59,309 allopathic doctors were registered with state medical councils and the Medical Council of India (MCI) as of March 31, 2019, the allopathic doctor-patient ratio was 1:1445.

The truth is that the majority of high-quality doctors work in large cities, where they have more opportunities. Unfortunately, such practice leaves a large number of citizens without primary medical care or in the hands of quacks.

In contrast to the gloomy healthcare situation, India's digital literacy is rapidly increasing. Telemedicine is already being viewed as a new avatar for healthcare providers[3].

India has an excellent digital infrastructure that allows for fast and cost-effective data sharing. As a result, the country is an excellent breeding ground for tele healthcare providers

Telemedicine is helping to close the healthcare gap in India. With a single click of the device, the most reputable, well-trained doctors can now treat patients in far-flung, distant parts of the country. Patients living in remote areas can now receive proper medical treatment and care thanks to improved digital infrastructure.

Healthcare digitization is a critical enabler for expanding precision medicine, transforming care delivery, and improving patient experience, allowing healthcare providers to increase value through improved outcomes.

Telemedicine is a useful tool for healthcare providers. The technical infrastructure requirements will vary depending on the type of telehealth services one intends to seek, but nearly all telehealth programs will necessitate access to broadband internet, imaging technology, or peripherals and access to technical support staff. Telemedicine systems can be used by health-care providers to reduce doctor-patient visits and break the chain of virus transmission during the pandemic [4].

In March 2020 by Medical Council of India came out with "Telemedicine Practice Guidelines"

It listed the type of medicines that can be prescribed via teleconsultation will be determined in consultation with the Central Government regularly.

The categories of medicines that can be prescribed are:

List O: It is safe to prescribe via any mode of teleconsultation. They would consist of 'over-the-counter medications.

List A: Medication that is relatively safe and can be prescribed during the initial consultation and is being prescribed for a refill in the event of a follow-up

List B: Medication that Registered Medical Practioner (RMP) may prescribe to a patient undergoing follow-up consultation in addition to those prescribed during the previous in-person consultation for the same medical condition.

Prohibited list: These medications have a high risk of abuse. These include medicines listed in Schedule X of the Drug and Cosmetic Act and Rules, as well as any Narcotic and Psychotropic Substance listed in the Narcotic Drugs and Psychotropic Substances Act and Rules [5].

Aside from the foregoing, the practitioner would be required to keep a digital trail/documentation of consultations. A fee for telemedicine consultation can be charged, and the patient may be given a receipt/invoice. When seeking consultation for an emergency, the goal should be to provide in-person care as soon as possible.

While telemedicine appears to be possible and satisfactory for a physician's patients, concerns about confidentiality, quality of care, and health inequities remain unresolved [6].

Patients' perceptions of time and distance are being profoundly altered by advances in information technology, which is transforming how they interact with and relate to others, including how they engage with medicine. As the general population becomes more comfortable with new technologies in all parts of daily life, new applications in health care are changing when, when, and how patients and clinicians interact [7].

Patient perception is a crucial part of the evaluation of telemedicine services, as patient satisfaction and experience are important factors in any possible expansion and are regularly used criteria for assessing health-care delivery [8].

Telemedicine may provide a potential solution to the low intensity medical care needs of many communities, particularly those in low socioeconomic communities, with the advent of prevalent smartphone availability, fast and widely available internet access, and pressing needs for healthcare services [9]. The benefits of reducing geographical constraints between patients and clinicians are also being leveraged to promote access to high-level critical care in places that are otherwise neglected by medical services [10].

A significant deal of study has shown that patients are very happy with the various types of care they receive via telemedicine. Patients in nations such as Italy, Scotland, South Korea, India, and Finland have expressed pleasure with various telemedicine initiatives. These patients have stated that they would utilise telemedicine again after having a telemedicine visit. This is not always the case, since several studies have found that patients are not always comfortable with telemedicine, sometimes due to difficulties operating the technology [11].

Healthcare systems must be provided with the necessary technology to establish telemedicine or to partner with e-health providers who have already developed accessible technologies to provide telemedicine to patients and their families [12].

Through the availability of self-monitoring tools, telehealth can specifically assist patients in becoming more aware about their own health issues and improving self-management. As a result, quality and more suitable patient treatment, as well as more efficient use of medical resources, should improve as the need for medical appointments for patients is decreased [13].

Governments are becoming more interested in developing telemedicine techniques, resulting in a gradual but steady increase in its use in public health. Telemedicine procedures will, hopefully, attain their full potential in a few years [14].

In certain circumstances, an organised telephone consultation looks to be an effective technique to replace or incorporate routine visits [15].

Poverty, illiteracy, hygiene, gender inequality, and a lack of universal healthcare remain major issues in India. The inequality in healthcare is mostly due to a scarcity of educated health care workers and a lack of required infrastructure in rural areas. Telemedicine can be used to overcome healthcare inequities in underprivileged areas, while it is not a replacement for traditional treatment [16].

The pandemic of Covid-19 in 2020 gave the nation's health services with an unparalleled chance to enhance access and coverage [17].

2.1 Literature Review

The telemedicine service acceptance has experienced tremendous growth in recent years especially due to COVID-19. The literature references various research models that attempt to explain telemedicine perception, adoption, and use. The existing literature also suggests that an individual’s intention to use a system or technology may result not only from the factors on the part of Service Taker with the direct interaction with the system or technology but can also be influenced by the factors on the part of the service provider. The majority of articles are related to the perception and attitude of individuals towards the adoption and usage of telemedicine services. This research study is positioned to explore the factor which affects the usage of telemedicine service by individuals. It looks at technology acceptance through the higher-level lens of application benefit acceptance, rather than through the product-attribute acceptance, or product development lens.

Finally, with emerging new technologies in the market, the consumers’ perspectives and experiences, and especially in the times of COVID-19 present both an opportunity and a challenge for telemedicine service provider firms. COVID-19 pandemic has imposed many restrictions on individuals, and individuals do not want to step out from their houses and need medical consultation at their home comfort but the medical service must be effective given the type of care and sophistication this type of service demands. The literature on Telemedicine, Telehealth, and patients has discussed topics including mobile difficulties faced and adoption, consumption patterns, factors for service providers, social commerce, and lifestyle implications, however, it is important to mention here that telemedicine services cannot be the answer to all problems and surely cannot replace an in-person medical

consultation or emergency medicine. However, it can make a substantial contribution to cope and emerge with the current pandemic of COVID-19. Furthermore, its wider acceptance and implementation will help us prepare better for any future pandemics.

Chart 1. Overview of Existing Research on Telemedicine			
A research study was done by	Constructs	Industry	Year
Dasgupta A, Deb S	Telemedicine: A new horizon in public health in India. Indian J Community Med.	Telemedicine and e-Health	2008
Saxena G, Singh JP	E-Medicine in India: Hurdles and Future Prospects,	Telemedicine and e-Health	2003
Mehta KG, Chavda P.	Telemedicine: A boon and the promise to rural India. J Rev Prog	Telemedicine and e-Health	2013
Bree E. Holtz 2020	Patients Perceptions of Telemedicine Visits Before and After the Coronavirus Disease 2019 Pandemic	Telemedicine and e-Health	2020 .
Doarn CR, Merrell RC.	The day the earth stood still: COVID-19.	Telemedicine and e-Health	2020
Whitten P, Holtz B	Series of papers for those yearning to propel telehealth to new heights.	Telemedicine and e-Health	2008
Whitten P, Holtz B. Provider	Utilization of telemedicine: The elephant in the room	Telemedicine and e-Health	2008
Whitten P, Holtz B, Meyer E	Nazione S. Telehospice: Reasons for slow adoption in-home hospice care	Telemedicine and e-Health	2009
Bergquist TF, Thompson K, Gehl C, Pineda JM.	Satisfaction ratings after receiving internet-based cognitive rehabilitation in persons with memory impairments after severe acquired brain injury.	Telemedicine and e-Health	2010

Bashshur R, Doarn CR, Frenk JM, Kvedar JC, Woolliscroft JO	Telemedicine and the COVID-19 pandemic, lessons for the future	Telemedicine and e-Health	2020
Barney A, Buckelew S, Mesheriakova V, Raymond-Flesch M. J Adolesc Health.	The COVID-19 pandemic and rapid implementation of adolescent and young adult telemedicine: challenges and opportunities for innovation	Telemedicine and e-Health	2020
Chaet D, Clearfield R, Sabin JE, Skimming K. J Gen Intern Med	Council on Ethical and Judicial Affairs American Medical Association. Ethical practice in telehealth and telemedicine	Telemedicine and e-Health	2017
Hollander JE, Carr BG. N Engl J Med.	Virtually perfect? Telemedicine for Covid-19	Telemedicine and e-Health	2020
American Medical Association. (2020)	Ethical Practice in Telemedicine	Telemedicine and e-Health	2020

Methods

The objective of the study was to answer factors that influence the perception of patients while using telemedicine services

A questionnaire was designed for data collection based on the literature review for content validity. The questionnaire included 21 questions and all measured on a five-point scale from “strongly agree “to “strongly disagree” and the questionnaire also contained questions related to the details of the respondent which were very essential to study. The questionnaire was based on the study Bree E. Holtz, 2020.

The survey was administered online using social media and emails, this channel of collecting was chosen as Covid 19 pandemic was at its peak. The link to the survey was posted and shared by social media and emails. To provide proper context and knowledge to the participants before answering the questions, the survey starts with a brief introduction to the

research goals, scope, process, and functionality of Telemedicine. The survey was open for 30 days.

The target population was individuals from the Delhi-NCR location whose age group was considered from the age of 18 years old to 39 years old in this survey. The sampling frame was composed of people from different educational backgrounds who usually seek medical consultations, aged 18 to 39. This group fits the target population profile. However, it is important to mention that given the technicality of the topic of the survey there was a need in the survey that the respondents who were aware of the given topic only those individual's responses were to be analyzed and to do it the questionnaire contained a question which asked that are you aware of telemedicine insurance and the respondents who choose the option NO, those individuals data are not analyzed. So there were a total of 220 respondents out of which 108 were not aware of the telemedicine so the final data analysis was done on 112 respondent's data who mentioned that they were aware of telemedicine and therefore the sample frame was deemed appropriate

Findings and Discussion

Table 1: Socio-demographic data of the participants

Socio-demographic data of participants (n=112)

	Gender	Age	Education	Employment status	Insurance Status
N	112	112	112	112	112
Mean	1.419643	1.116071	2	1.410714286	2.071428571
Median	1	1	2	1	2
Skewness	0.330099	2.429892	1.415992	1.387848488	0.492945594
Std. Error of Skewness	0.228434	0.228434	0.228434	0.228434472	0.228434472
Kurtosis	-1.92575	3.975048	2.025603	0.569951906	-1.312180792
Std. Error of Kurtosis	0.453092	0.453092	0.453092	0.453091764	0.453091764

Table 2: Frequency table of preference of telemedicine provider

Frequency Tables

	If you have used telemedicine or wants to use telemedicine in the future, which provider do you choose/will choose	Frequency	Percent	Valid Percent
Valid	1mg	32	28.57142	28.57142
	DocOnline	9	8.035714	8.035714
	eSanjeevani	9	8.035714	8.035714
	Practo	22	19.642851	19.642851
	Any other	10	8.92857	8.92857
	Not applicable	30	26.78571	26.78571
	Total	112	100	100

Table 2 illustrates that 28.57% of the respondents use or would like to use 1mg, 8.03% of the respondents use or would like to use DocOnline and eSanjeevani, 19.64% of the respondents use or would like to use Practo, 8.92% of the respondents use or would like to use any other platform which option was not provided in the questionnaire and 26.78% of the respondents do not use or would not be using telemedicine for any medical consultation.

Table 3: Frequency table of Usage of Telemedicine

	Have you used Telemedicine	Frequency	Percent	Valid Percent
Valid	Yes	37	33.03571	33.03571
	No	75	66.96428	66.96428
	Total	112	100	100

Table 3 shows that 33.04% of the respondents have used telemedicine and 66.96% of the respondents have not used telemedicine.

Table 4: Frequency table of Insurance Status

	Insurance Status	Frequency	Percent	Valid Percent
Valid	Insurance purchased directly	53	47.32142	47.32142
	Insurance through employer	16	14.28571	14.28571
	No health insurance	25	22.32142	22.32142
	Other	18	16.07142	16.07142
	Total	112	100	100

Table 4 shows that 47.32% of the respondents have Insurance purchased directly, 14.28% of the respondents have Insurance through their employer, 22.32% of the respondents have no health insurance and 16.07% of the respondents have other arrangements for them.

Table 5: Frequency table of Employment Status

	Employment status	Frequency	Percent	Valid Percent
Valid	Student	78	69.64285	69.64285
	Self Employed	22	19.642851	19.642851
	Other	12	10.71428	10.71428
	Total	112	100	100

Table 5 shows that 69.64% of the respondents were students, 19.64% of the respondents were self-employed 69.64% of the respondents fall under the others category.

Table 6: Frequency table of Education

	Education	Frequency	Percent	Valid Percent
Valid	Bachelor Degree	31	27.67857	27.67857
	Master Degree	66	58.92857	58.92857
	PhD	2	1.78571	1.78571
	Professional degree	10	8.92857	8.92857

	Prefer not to answer	3	2.67857	2.67857
	Total	112	100	100

Table 6 shows that 27.67% of the respondents hold Bachelor's Degree, 58.92% of the respondents hold a Master's Degree, 1.78% of the respondents were Ph.D., 8.92 of the respondents hold Professional Degree and 2.67% of the respondents prefer no answer.

Table 7: Frequency table of Age

	Age Group	Frequency	Percent	Valid Percent
Valid	18-29	99	88.39285	88.39285
	30-39	13	11.60714	11.60714
	Total	112	100	100

Table 7 shows that there were 88.39% of the respondents from the age group 18-29 and 11.60% of the respondents from the age group 30-39

Table 8: Frequency table of Gender

	Gender	Frequency	Percent	Valid Percent
Valid	Male	65	58.03571	58.03571
	Female	47	41.96438	41.96438
	Total	112	100	100

Table 8 shows that there were 58.04% male respondents and 41.96% female respondents.

Cross Tabs Analysis

Insurance Status for Gender, Age, Education, and Employment Status

Table 9: Insurance Status and Gender Crosstabulation

Relationship between Demographic Factors and Insurance Status.

Insurance Status * Gender Crosstabulation				
Count				
		Gender		Total
		Male	Female	
Insurance Status	Insurance purchased directly	36	6	53
	Insurance through employer	14	2	16
	No health insurance	6	19	25
	Other	9	9	18
Total		65	47	112

In the above table n is 112. Out of 112, 53 (47.32%) have purchased the insurance directly, 16(14.28%) have Insurance through an employer, 25(22.32%) have no health insurance and 18 (16.07%) have other arrangements for them. In the Male group out of 65, 36(55.38%) has purchased the insurance directly, 14(21.53%) has Insurance through an employer, 6(9.23%) has No health insurance and 9 (13.84%) have other arrangements for them and In the Female group out of 47, 6(12.5%) has purchased the insurance directly, 2(4.16%) has Insurance through an employer, 19(39.58%) has No health insurance and 9 (18.75%) have other arrangements for them.

Table 10: Insurance Status and Age Group Crosstabulation

Insurance Status * Age Group Crosstabulation			
Count			
	Age Group		Total
	18-29	30-39	

Insurance Status	Insurance purchased directly	44	9	53
	Insurance through employer	13	3	16
	No health insurance	25	0	25
	Other	17	1	18
Total		99	13	112

In the above table n is 112. Out of 112, 53 (47.32%) have purchased the insurance directly, 16(14.28%) have Insurance through an employer, 25(22.32%) have no health insurance and 18 (16.07%) have other arrangements for them. In the age group of 18-29 out of 99, 44(44.44%) has purchased the insurance directly, 13(13.13%) has Insurance through an employer, 25(25.25%) has No health insurance and 17 (17.17%) have other arrangements for them and In the age group of 30-39 out of 13, 9(69.23%) has purchased the insurance directly, 3(23.07%) has Insurance through employer and 1(7.69%) have other arrangements for them.

Table 11: Insurance Status and Education Crosstabulation

Insurance Status * Education Crosstabulation							
Count		Education					
		Bachelors	Masters	PhD	Professional	Prefer not to say	Total
Insurance Status	Insurance purchased directly	20	24	1	7	1	53
	Insurance through employer	6	9	0	1	0	16
	No health insurance	3	20	0	0	2	25
	Other	2	13	1	2	0	18
Total		31	66	2	10	3	112

In the above table n is 112. Out of 112, 53 (47.32%) have purchased the insurance directly, 16(14.28%) have Insurance through an employer, 25(22.32%) have no health insurance and

18 (16.07%) have other arrangements for them. In the Bachelor's Degree group out of 31, 20(64.51%) has purchased the insurance directly, 6(19.35%) has Insurance through an employer, 3(9.67%) has No health insurance, and 2 (6.45%) have other arrangements for them, in the Master's Degree group out of 66, 24(36.36%) has purchased the insurance directly, 9(13.63%) has Insurance through an employer, 20(30.30%) has No health insurance and 13(19.69%) have other arrangements for them, in the Ph.D. group out of 2, 1(50%) has purchased the insurance directly, and 1(50%) have other arrangements for them, in Professional group out of 10, 7(70%) has purchased the insurance directly, 1(10%) has Insurance through an employer, and 2(30%) have other arrangements for them, and 3(2.67%)individuals out of 112 did not prefer to state their education.

Table 12: Insurance Status and Employment Status Crosstabulation

Insurance Status * Employment Status Crosstabulation					
Count					
		Employment Status			Total
		Student	Self Employed	Other	
Insurance Status	Insurance purchased directly	32	16	5	53
	Insurance through employer	8	4	4	16
	No health insurance	23	2	0	25
	Other	15	0	3	18
Total		78	22	12	112

In the above table n is 112. Out of 112, 53 (47.32%) have purchased the insurance directly, 16(14.28%) have Insurance through an employer, 25(22.32%) have no health insurance and 18 (16.07%) have other arrangements for them. In the Student group out of 78, 32(41.02%) has purchased the insurance directly, 8(10.25%) has Insurance through an employer, 23(29.48%) has No health insurance and 15 (%) have other arrangements for them, in the Self Employed group out of 22, 16(72.72%) has purchased the insurance directly, 4(18.18%) has Insurance through an employer, and 2(9.09%) has No health insurance. In the others group out of 12, 5(41.66%) have purchased the insurance directly, 4(33.33%) have Insurance through an employer, and 3 (25%) have other arrangements for them.

Have you used Telemedicine for:? Gender, Age, Education, and Employment Status

Relationship between Demographic Factors and Telemedicine Usage.

Table 13: Usage of Telemedicine and Gender Crosstabulation

Have you used Telemedicine * Gender Crosstabulation				
Count				
		Gender		Total
		Male	Female	
Have you used Telemedicine	Yes	26	11	37
	No	39	36	75
Total		65	47	112

In the above table n is 112. Out of 112, 37 (33.03%) have used telemedicine, and 75(66.96%) have not used telemedicine. In the Male group out of 65, 26(40%) have used telemedicine, and 39(60%) have not used telemedicine, and in the Female group out of 47, 11(23.40%) have used telemedicine, 36(76.59%) have not used telemedicine.

Table 14: Usage of telemedicine and Age Group Crosstabulation

Have you used Telemedicine * Age Group Crosstabulation				
Count				
		Age Group		Total
		18-29	30-39	
Have you used Telemedicine	Yes	34	3	37
	No	65	10	75
Total		99	13	112

In the above table n is 112. Out of 112, 37 (33.03%) have used telemedicine, and 75(66.96%) have not used telemedicine. In the age group 18-29 out of 99, 34(34.34%) have used telemedicine, and 65(65.66%) have not used telemedicine, and in the age group 30-39 out of 13, 3(23.07%) have used telemedicine, 10 (76.92%) have not used telemedicine.

Table 15: Usage of telemedicine and Education Crosstabulation

Have you used Telemedicine * Education Crosstabulation							
Count							
		Education					Total
		Bachelors	Masters	PhD	Professional	Prefer not to say	
Have you used Telemedicine	Yes	11	22	0	4	0	37
	No	20	44	2	6	3	75
Total		31	66	2	10	3	112

In the above table n is 112. Out of 112, 37 (33.03%) have used telemedicine, and 75(66.96%) have not used telemedicine. In the Bachelor's Degree group out of 31, 11(35.48%) have used telemedicine, and 20(64.51%) have not used telemedicine, in the Master's Degree group out of 66, 22(33.33%) have used telemedicine, 44 (66.67%) have not used telemedicine, in the Ph.D. group all 2 of them have not used telemedicine, in Professional group out of 10, 4(40%) have used telemedicine, 6 (60%) have not used telemedicine.

Table 16: Usage of telemedicine and Employment Status Crosstabulation

Have you used Telemedicine * Employment Status Crosstabulation					
Count					
		Employment Status			Total
		Student	Self Employed	Other	
Have you used Telemedicine	Yes	24	11	2	37
	No	54	11	10	75
Total		78	22	12	112

In the above table n is 112. Out of 112, 37 (33.03%) have used telemedicine, and 75(66.96%) have not used telemedicine. In the student group out of 78, 24(30.76%) have used telemedicine, and 54(69.23%) have not used telemedicine, in the self-employed group out of 22, 11(50%) have used telemedicine and 11 (50%) have not used telemedicine and in others group out of 12, 2(16.66%) have used telemedicine, 10 (83.33%) have not used telemedicine.

Factor Analysis

Table 17: KMO and Bartlett's test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.74533539
Bartlett's Test of Sphericity	Approx. Chi-Square	1211.86431
	df	210
	Sig.	.000

The Kaiser-Meyer-Olkin (KMO) test is used in this research to determine the sampling adequacy of data that are used for Factor Analysis, it indicates the proportion of variance in your variables that might be caused by underlying factors. And when this test was applied to the data set then it was found that there was sampling adequacy of the provided data.

Table 18: Survey Items, Means, and Standard Deviations

Descriptive Table

Descriptive Statistics		
Questions	Mean	Std. Deviation
Q1)) I had/ will have difficulty hearing the health care provider over the computer/mobile system	3.66964286	0.998994
Q2) I had/ will have difficulty seeing the health care provider over the computer/mobile system	3.60714286	1.0341654
Q3) I would have gotten/ will get better care if I had seen the health care provider in person	2.38392857	1.14093
Q4) The next time I would/will prefer to see a health care provider in person despite the possible inconvenience	2.99107143	1.1816581
Q5) It was/will be easy to arrange an appointment	2.72321429	1.1167022
Q6) The health care provider dominated/will dominate the conversation	3.1875	1.0269455
Q7) The health care provider spent/will spend little time taking my medical history	3.14285714	1.0893187
Q8) There was/will be less communication with the provider (than I normally receive in person) using telemedicine	2.82142857	1.1086416
Q9) The health care provider who provided/will provide me care genuinely seemed to care about me	2.89285714	0.9712734
Q10) I felt/feel like my privacy was/will be invaded during the telemedicine visit	3.38392857	1.1250268
Q11) I am/will be worried about the confidentiality of my private information being exchanged through the telemedicine visit	3.01785714	1.3150696
Q12) I am/will be worried about the continuity of care (i.e., I do not see my same provider every time)	2.69642857	1.0974113
Q13) I was/will be concerned that my primary care provider would/will not get my visit information	3.08035714	1.0495678
Q14) I was/will be concerned that my insurance would/will not cover my telemedicine visit	2.91071429	1.2269759
Q15) I generally/will use telemedicine when my provider is not open (after hours, holidays, etc.)	2.52678571	1.1227365
Q16) I generally/will use telemedicine when I feel too sick to leave the house	2.65178571	1.205915
Q17) I have used/will use telemedicine because I did/may not feel like my condition was/will be too urgent	2.67857143	0.9416708
Q18) I did/will not want to infect (cold, flu, etc.) other people in a waiting room	2.45535714	1.0474198
Q19) I did/will not want to get infected in the waiting room by other people	2.53571429	1.1619227

(cold, flu, etc.)		
Q20) It is/will be easy to get into my primary care provider	2.67857143	0.9416708
Q21) I am/will be worried about the accuracy of the information from the telemedicine health care provider	2.89285714	1.0599774

Factor Loading

Table 19: Component Matrix

Component Matrix		
	Component	
	1 Factors from Service Provider	2 Factors from Service Taker
Q1) I had/ will have difficulty hearing the health care provider over the computer/mobile system	0.26386014	0.7651884
Q2) I had/ will have difficulty seeing the health care provider over the computer/mobile system	0.2368044	0.7511094
Q3) I would have gotten/ will get better care if I had seen the health care provider in person	0.6911238	0.0479747
Q4) The next time I would/will prefer to see a health care provider in person despite the possible inconvenience	0.66931249	0.0879913
Q5) It was/will be easy to arrange an appointment	0.37225786	-0.565213
Q6) The health care provider dominated/will dominate the conversation	0.31270765	0.2839717
Q7) The health care provider spent/will spend little time taking my medical history	0.56416726	0.307719
Q8) There was/will be less communication with the provider (than I normally receive in person) using telemedicine	0.47931639	0.5046623
Q9) The health care provider who provided/will provide me care genuinely seemed to care about me	0.38002229	-0.145973
Q10) I felt/feel like my privacy was/will be invaded during the telemedicine visit	0.39395197	0.5685342
Q11) I am/will be worried about the confidentiality of my private information being exchanged through the telemedicine visit	0.2988704	0.54076656
Q12) I am/will be worried about the continuity of care (i.e., I do not	0.64977248	-0.045481

see my same provider every time)		
Q13) I was/will be concerned that my primary care provider would/will not get my visit information	0.3033678	0.58603058
Q14) I was/will be concerned that my insurance would/will not cover my telemedicine visit	0.59970782	0.0529066
Q15) I generally/will use telemedicine when my provider is not open (after hours, holidays, etc.)	-0.421974	0.51061452
Q16) I generally/will use telemedicine when I feel too sick to leave the house	-0.444759	0.59846903
Q17) I have used/will use telemedicine because I did/may not feel like my condition was/will be too urgent	-0.402311	0.5445577
Q18) I did/will not want to infect (cold, flu, etc.) other people in a waiting room	-0.395881	0.64620424
Q19) I did/will not want to get infected in the waiting room by other people (cold, flu, etc.)	-0.361954	0.72255654
Q20) It is/will be easy to get into my primary care provider	-0.353312	0.6179665
Q21) I am/will be worried about the accuracy of the information from the telemedicine health care provider	0.63396847	0.2533514

Extraction Method: Principal Component Analysis (2 components extracted)

Also to further analyze this data we have analyzed by component matrix and factor loading. Component matrix: This table contains component loadings, which are the correlations between the variable and the component. Because these are correlations, possible values range from -1 to +1. The component in this matrix is presented in the columns that have been extracted.

Questions that were loaded on component 1

Q3 I would have gotten/ will get better care if I had seen the health care provider in person

Q4 The next time I would/will prefer to see a health care provider in person despite the possible inconvenience

Q5 It was/will be easy to arrange an appointment

Q6 The health care provider dominated/will dominate the conversation

Q7 The health care provider spent/will spend little time taking my medical history

Q9 The health care provider who provided/will provide me care genuinely seemed to care about me

Q12 I am/will be worried about the continuity of care (i.e., I do not see my same provider every time)

Q14 I was/will be concerned that my insurance would/will not cover my telemedicine visit

Q21 I am/will be worried about the accuracy of the information from the telemedicine health care provider

Questions that were loaded on component 2

Q1 I had/ will have difficulty hearing the health care provider over the computer/mobile system

Q2 I had/ will have difficulty seeing the health care provider over the computer/mobile system

Q8 There was/will be less communication with the provider (than I normally receive in person) using telemedicine

Q10 I felt/feel like my privacy was/will be invaded during the telemedicine visit

Q11 I am/will be worried about the confidentiality of my private information being exchanged through the telemedicine visit

Q13 I was/will be concerned that my primary care provider would/will not get my visit information

Q15 I generally/will use telemedicine when my provider is not open (after hours, holidays, etc.)

Q16 I generally/will use telemedicine when I feel too sick to leave the house

Q17 I have used/will use telemedicine because I did/may not feel like my condition was/will be too urgent

Q18 I did/will not want to infect (cold, flu, etc.) other people in a waiting room

Q19 I did/will not want to get infected in the waiting room by other people (cold, flu, etc.)

Q20 It is/will be easy to get into my primary care provider

Now from the factor analysis and loading in the component matrix it can be concluded and inferred that the questions that are loaded in every component must fall under the common category of nature of perception and behavioural aspects like:

Component 1 intends to deduce the Factors from Service Provider from the respondents.

Component 2 intends to deduce the Factors from Service Taker from the respondents.

In Component Matrix, we can see that there is factor loading that has taken place i.e. in each component a set of questions get loaded. The interpretation of the analysis suggests that the individual's intention to use a system or technology may result not only from the factors on

the part of Service Taker with the direct interaction with the system or technology but can also be influenced by the factors on the part of the service provider.

As this study was done from a patient point of view so the telemedicine service providers who are providing such a service in the Indian market must consider the factors as they play a very important role while adopting any new technology and service. Service providers can also design their interface, appointment process, and consultation process by considering these aspects as a patient give very importance to these factors.

Conclusion

Despite these constraints, the findings of this study provide insight into people's impressions of telemedicine use as a result of the coronavirus outbreak, which could be valuable in arguing for the services to be financed and used indefinitely. During this pandemic, telemedicine has seen unparalleled adoption and application. Researchers and practitioners interested in telemedicine should be aware that the public at large has a favourable opinion of the service. There are a few unanswered problems and issues to be investigated, such as contentment levels over time and how these perceptions may alter. A few of the issues that these varieties of perspectives and observed should be remedied if telemedicine is to remain to be a core method of giving and receiving health care to the public.

The healthcare industry should have an interface that is easy to use and appointments can be made easily and the medical consultation for an individual must be given medical practitioner only and the patient history can also be tracked by the medical practitioner easily so that the treatment of the patient can be done most effectively. These programs must also ensure that they must communicate that the privacy of an individual is protected while using the telemedicine services by deploying various security software and following the government rules and guidelines framework which is made for the telemedicine services provider, that will also increase the credibility of the services among the masses, which is need of the hour.

The effect of COVID-19 has pushed the nation’s healthcare delivery systems into a new era of advancement centered on telemedicine services. Providers need to answer to the challenge of how to provide care in a time of social distancing and isolation and have proved telemedicine is a viable alternative to seeing every single patient in the clinic

However, it is important to mention here that telemedicine services cannot be the answer to all problems and surely cannot replace an in-person medical consultation or emergency medicine. However, it can make a substantial contribution to cope and emerge with the current pandemic of COVID-19. Furthermore, its wider acceptance and implementation will help us prepare better for any future pandemics.

References

1. Mehta KG, Chavda P. Telemedicine: A boon and the promise to rural India. J Rev Prog. 2013; 1:1–3.
2. Holtz, B. (2021). Patients Perceptions of Telemedicine Visits Before and After the Coronavirus Disease 2019 Pandemic. *Telemedicine And E-Health*, *27*(1), 107-112. doi: 10.1089/tmj.2020.0168
3. Dasgupta A, Deb S. Telemedicine: A new horizon in public health in India. Indian J Community Med. 2008; 33:3–8.
4. Saxena G, Singh JP. E-Medicine in India (2003): Hurdles and Future Prospects, Paper Presentation at an International Seminar Organized at The International Institute of Professional Studies Devi Ahilya University, Indore
5. Telemedicine Practice Guidelines - Enabling Registered Medical Practitioners to Provide Healthcare Using Telemedicine. Appendix 5 of the Indian Medical Council (Professional Conduct, Etiquette and Ethics Regulation) 2002. (2021). Retrieved 6 August 2021, from https://www.mohfw.gov.in/pdf/Telemedicine.

6. The COVID-19 pandemic and rapid implementation of adolescent and young adult telemedicine: challenges and opportunities for innovation [published online ahead of print, 2020 May 14] Barney A, Buckelew S, Mesheriakova V, Raymond-Flesch M. J Adolesc Health.
7. Council on Ethical and Judicial Affairs American Medical Association. Ethical practice in telehealth and telemedicine. Chaet D, Clearfield R, Sabin JE, Skimming K. J Gen Intern Med. 2017; 32:1136–1140.
8. Dario, C., Luisotto, E., Dal Pozzo, E., Mancin, S., Aletras, V., Newman, S., ... & Saccavini, C. (2016). Assessment of patients' perception of telemedicine services using the service user technology acceptability questionnaire. International journal of integrated care, 16(2).
9. Sechrist, E., Dong, F., Lee, C., Chon, K., Neeki, A., Winston, L., ... & Neeki, M. M. (2020). Patients' perception of telemedicine in a large urban inner-city emergency department: a cross-sectional survey. Cureus, 12(10).
10. Peine, A., Paffenholz, P., Martin, L., Dohmen, S., Marx, G., & Loosen, S. H. (2020). Telemedicine in Germany during the COVID-19 pandemic: multi-professional national survey. Journal of medical Internet research, 22(8), e19745.
11. Whitten P, Holtz B, Laplante C. Telemedicine: What have we learned? Appl Clin Inform. 2010 May 5;1(2):132-41. doi: 10.4338/ACI-2009-12-R-0020. PMID: 23616832; PMCID: PMC3632278.
12. Pappot, N., Taarnhøj, G. A., & Pappot, H. (2020). Telemedicine and e-health solutions for COVID-19: patients' perspective. Telemedicine and e-Health, 26(7), 847-849.

13. Lee, P. A., Greenfield, G., & Pappas, Y. (2018). Patients' perception of using telehealth for type 2 diabetes management: a phenomenological study. BMC health services research, 18(1), 1-9.
14. Chellaiyan, V. G., Nirupama, A. Y., & Taneja, N. (2019). Telemedicine in India: Where do we stand?. Journal of family medicine and primary care, 8(6), 1872.
15. Ghosh, A., Gupta, R., & Misra, A. (2020). Telemedicine for diabetes care in India during COVID19 pandemic and national lockdown period: guidelines for physicians. Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 14(4), 273-276.
16. Mathur, P., Srivastava, S., Lalchandani, A., & Mehta, J. L. (2017). Evolving role of telemedicine in health care delivery in India. Prim Health Care, 7(260), 2167-1079.
17. Agarwal N, Jain P, Pathak R, Gupta R. Telemedicine in India: A tool for transforming health care in the era of COVID-19 pandemic. J Educ Health Promot. 2020 Jul 28;9:190. doi: 10.4103/jehp.jehp_472_20. PMID: 32953916; PMCID: PMC7482629.