

## Original Research Article

# Patient's experience of telemedicine during COVID-19 pandemic in a tertiary care centre in North India: a telephonic survey

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**Received:** 22 March 2021

**Accepted:** 17 April 2021

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## ABSTRACT

**Background:** Unprecedented situation of COVID-19 pandemic and measures to contain spread of the disease has expanded the horizon of health care delivery utilizing the telemedicine into the clinical practice. To understand the patients' preferences for future incorporation of telemedicine practice into the health care system, we conducted a survey via telephone/WhatsApp.

**Methods:** A structured survey questionnaire was administered via telephone/WhatsApp to patients attending telemedicine consultation.

**Results:** Total 463 patients participated in the survey. Participants having favorable attitude was 237 (51.3%) and not in favors were 225 (48.7%). Among the respondents, the most common reason to choose Telemedicine was due to COVID 19 risk (70%), whereas monetary benefits were reported by only 2% of respondents. 297 respondents were of the opinion that they will continue to use tele-consultation services even after the pandemic.

**Conclusions:** Patients reported satisfactory response using telemedicine during COVID-19 pandemic, but felt the need of physical examination at least during first consultation. Telemedicine may be suitable for screening, medium-term and long-term follow up. Easy and cheap availability of internet is also an issue particularly in low income and rural population.

**Keywords:** Telemedicine, COVID-19, Survey, Questionnaire

## INTRODUCTION

On 11 march 2020 COVID-19 outbreak was declared as pandemic by WHO. This announcement followed the declaration of a public health emergency of international concern (PHEIC) on January 30.

Although the case fatality rate of severe acute respiratory syndrome (SARS) (CFRs of 9.6%) and middle East respiratory syndrome (MERS) (CFRs 34.4%) were much higher than current pandemic, yet COVID-19 pandemic

leads to more death due to involvement of large number of populations. Human-to-human transmission of the SARS-CoV-2 (Severe acute respiratory syndrome corona virus 2) virus has become the primary transmission route of the disease.<sup>1</sup>

The primary strategy was early diagnosis, patient's isolation, contact tracing, symptomatic monitoring of contact, suspect as well as patients, public quarantine and follow-up. The various type of restriction and confinement of population leads to disruption of general

health care of non-COVID patients. In this scenario telemedicine was very useful to prevent the spread of disease. Telemedicine can support long-distance clinical care, education, and health administration, and its use has increased dramatically in the past decade.

The peripheral health system of India especially in eastern part is not well developed till now. High-quality medical resources are concentrated in large- and medium-sized cities, and many county- and district-level hospitals face shortages of qualified personnel and inadequate technology for diagnosis and treatment. In such scenario of overburdened health infrastructure and COVID pandemic, telemedicine proved very useful. To study patient response, satisfaction and perception about telemedicine we conducted a survey in AIIMS Raebareli. This newly established institute caters a large population from villages and remote areas. Our first objective was to survey the level of satisfaction among population towards telemedicine, second objective was to do univariate and multivariate analysis of different socio demographic factors in relation to attitude towards telemedicine.

## METHODS

Present study is a web based cross sectional study carried out with patients who underwent a telephonic/ WhatsApp based telemedicine consultation amid to COVID-19 pandemic between April 18, 2020 to 31 August, 2020 at AIIMS Raebareli. AIIMS Raebareli Uttar Pradesh is a tertiary rural hospital situated in eastern Uttar Pradesh. Before this pandemic teleconsultation was not routinely practiced in our present setup. All the patients who had participated in telemedicine consultation during the study period and given consent to become part of the online survey were included in the study. Patients less than 18 years old, and those were unable to provide written informed consent were excluded. Patients seeking consultation from general surgery, general medicine, otolaryngology, obstetrics and gynecology were included. Universal sampling method was used for selecting the participants.

During designing the survey, we didn't find any widely validated questionnaires to assess the perception of patients towards telemedicine consultation. A pre designed pretested self-structured questionnaire was used for data collection using Google form. Questionnaires were adapted from the telemedicine satisfaction questionnaire and on the telehealth usability questionnaire after modifications according to present scenario and local culture.<sup>2,3</sup> Questionnaire had two parts: part 1 comprises of socio demographic variable of the participants and 2<sup>nd</sup> part comprises of questions for assessing attitude towards tele consultation. Attitude towards tele consultation was assessed using 5 attitude related statements and patients were asked to provide answers to these fields on a Likert scale from 1 to 5. Maximum attainable score in attitude questionnaire was

25 and minimum was 5. Positive attitude towards tele medicine was operationally defined at the score of 18 or above considering the mean data distribution of our finding. Teleconsultation was defined as those consultations conducted through telephone/WhatsApp.

All the data were entered into a Microsoft excel worksheet (Microsoft, Redwoods, WA, USA) and were analyzed using SPSS software (Statistical package for the social sciences Inc., Chicago, IL, USA), version 21.0. For descriptive statistics, categorical data were expressed in proportions and continuous data in mean and standard deviation. Significance of association between the two attributes was analyzed using Pearson's Chi-square test statistic. Binary multivariable logistic regression analysis was done to find the sociodemographic predictors of attitude towards tele consultation. Dependent variable was level of satisfaction and it was categorized as favorable (19-25) and unfavorable (5-18) considering the mean score of the participants. Favorable attitude score was coded as 1 and unfavorable score as 0. The entire demographic variables (e.g., age, gender, etc.) were considered as independent variable for binary logistic regression. All the  $p < 0.05$  was considered as statistically significant. During the whole period of research, we followed the ethical guidelines mentioned by ICMR. Confidentiality and anonymity were maintained during the entire study period.

## RESULTS

Total 463 individuals participated in this survey from April 18 to 31 august 2020. Demographic information from Patient's survey group is summarized in Table 1.

Table 1 shows that majority of the participants was from 18-40 years age group (73.4%), male by gender (65.4%), from urban area (68.2%), up to graduation by education (47.0%), employed by profession (61.5%) and were under weight (33.1%).

Mean score of the participants' attitude towards online consultation was  $18.52 \pm 3.48$ . Minimum score obtained was 9 and maximum 25. Considering mean score as cut off point for favorable and non-favorable attitude towards online consultation, Participants having favorable attitude was 237 (51.3%) and not in favors was 225 (48.7%). Figure 1 graphically depicts the participant's response through a Likert plot.

Among 5 components for assessing attitude towards tele-consultation using 5-point Likert scale maximum favorable score was obtained on the statement "At the time of COVID pandemic telemedicine is safer compared to regular OPD consultation"  $4.42 \pm 0.893$  and minimum was "I would prefer to visit regular OPD compared to telemedicine even in the time of COVID pandemic"  $3.10 \pm 1.390$  (Table 2).

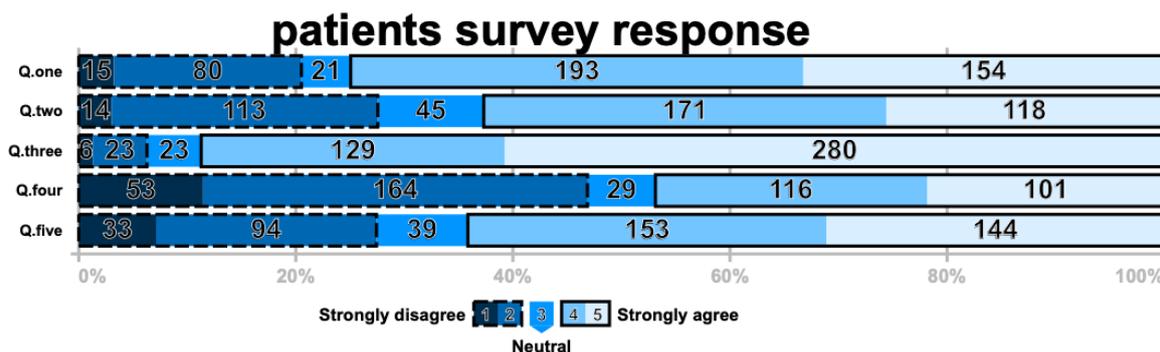


Figure 1: Response of participants towards attitude related questionnaire about tele consultation.

Table 1: Demographic characteristics of the participants, (n=462).

Variable	Number	Percentage (%)
<b>Age (years)</b>		
18-40	339	73.4
41-60	99	21.4
>60	24	5.2
<b>Gender</b>		
Male	302	65.4
Female	160	34.6
<b>Locality</b>		
Urban	315	68.2
Rural	147	31.8
<b>Education</b>		
Up to matriculation	120	26.0
Up to graduate	217	47.0
Above graduate	125	27.0
<b>Occupation</b>		
Unemployed	93	20.1
Employed	284	61.5
Student	85	18.4
<b>BMI (kg/m<sup>2</sup>)</b>		
Under weight ( $\leq 18.5$ )	153	33.1
Normal (18.5-24.9)	147	31.8
Overweight (25.0-29.9)	105	22.7
Obese (30.0 and above)	57	12.3

Table 3 shows that age wise categorization 41-60 years age group had maximum favorable attitude (53.5%) towards online consultation whereas >60 years age group (29.2%) had minimum positive attitude towards it but the difference was not statistically significant (p=0.081). Male (55.6%) had more favorable attitude towards tele consultation compared to female (43.1%) and this was statistically significant (p=0.01). Similarly urban participants (54.0%) and those had education up to graduation level (53.0%) had more favorable attitude towards tele consultation compared to others but these differences were also not statistically significant

(p=0.093, p=0.788). Occupation wise categorization shows that students (58.8%) had more favorable attitude compared to others towards online consultation but this was not statistically significant (p=0.145). Similarly, BMI classification shows that underweight (54.9%) had maximum positive attitude towards telemedicine compared to others but this was also not statistically significant (p=0.548).

Table 2: Component wise preference of the participants towards online consultation.

Component	Mean score $\pm$ SD
Telemedicine is much comfortable than usual OPD consultation	3.85 $\pm$ 1.151
Telemedicine and OPD consultation are same	3.58 $\pm$ 1.196
At the time of COVID pandemic telemedicine is safer compared to regular OPD consultation	4.42 $\pm$ 0.893
I would prefer to visit regular OPD compared to telemedicine even in the time of COVID pandemic	3.10 $\pm$ 1.390
After COVID pandemic is over than also I would prefer to consult with the telemedicine mode	3.60 $\pm$ 1.303

In binary multivariable logistic regression analysis, there was not much multicollinearity among the independent variable because lowest tolerance value is 0.803 and range of variance inflation factor (VIF) is 1.064-1.246. The model was well fitted with a nonsignificant value (p=0.318) using Hosmer and Lemeshow test. After controlling for the predictors, the model explained between 44.0% (Cox and Snell R<sup>2</sup>) and 58.0% (Nagelkerke R<sup>2</sup>) of the variance of score of attitudes towards online consultation among the study participants and correctly classified 69.0% of the cases. Gender, age and locality (residence) had a significant association with the attitude of favoring or disfavoring online OPD consultation. Male participants (OR=1.873, p=0.10) and

young (18-40 years) [OR=2.859, p=0.030] and middle age (40-60 years) [OR=2.987, p=0.030] participants had higher odds of favoring tele consultation compared to female and elderly participants and this association was statistically significant. Similarly rural participants (OR=0.642, p=0.037) had less odds of preferring tele medicine compared to urban and this was also statistically significant (Table 4). Education, occupation and BMI

don't hold any significant association with preferences of telemedicine using binary multivariate logistic regression.

We also inquired about the reason of choosing telemedicine, of which 70% of respondents choose tele medicine because of existing COVID-19 pandemic, 15.5% patients chose telemedicine to save time and 12.5% because of ease.

**Table 3: Bivariate association between attitude towards online consultation and demographic variable.**

Variable	Attitude towards online consultation		Chi square	P value
Age (Year)	Non favorable	Favorable		
18-40	162 (47.8)	177 (52.2)	5.017	0.081
41-60	46 (46.5)	53 (53.5)		
>60	17 (70.8)	7 (29.2)		
<b>Gender</b>				
Female	91 (56.9)	69 (43.1)	6.56	0.011
Male	134 (44.4)	168 (55.6)		
<b>Locality</b>				
Urban	145 (46.0)	170 (54.0)	2.824	0.093
Rural	80 (54.4)	67 (45.6)		
<b>Education</b>				
Up to matriculation	60 (50.0)	60 (50.0)	0.475	0.788
Up to graduate	102 (47.0)	115 (53.0)		
Above graduate	63 (50.4)	62 (49.6)		
<b>Occupation</b>				
Employed	52 (55.9)	41 (44.1)	3.864	0.145
Unemployed	138 (48.6)	146 (51.4)		
Student	35 (41.2)	50 (58.8)		
<b>BMI (kg/m<sup>2</sup>)</b>				
Under weight ( $\leq 18.5$ )	69(45.1)	84 (54.9)	2.11	0.548
Normal (18.5-24.9)	71 (48.3)	76 (51.7)		
Overweight (25.0-29.9)	57 (54.3)	48 (45.7)		
Obese (30.0 and above)	28 (49.1)	29 (50.9)		

**Table 4: Binary multivariable logistic regression for association between attitude towards tele consultation and socio demographic factors.**

Variable	B	SE	Wald	df	Significance	AOR (95% CI)
<b>Gender</b>						
Female	Reference					
Male	0.628	0.243	6.653	1	0.010	1.873 (1.163-3.019)
<b>Age (Year)</b>						
18-40	1.050	0.483	4.729	1	0.030	2.859 (1.109-7.368)
40-60	1.094	0.505	4.693	1	0.030	2.987 (1.110-8.040)
>60	Reference					
<b>Locality</b>						
Urban	Reference					
Rural	-0.443	0.212	4.355	1	0.037	0.642 (0.424-0.973)
<b>Education</b>						
Up to matriculation	Reference					
Up to graduate	0.157	0.275	0.328	1	0.567	1.170 (.683-2.005)
Post-graduate and above	0.091	0.234	0.152	1	0.696	1.096 (0.692-1.735)
<b>Occupation</b>						
Student	Reference					

Continued.

Variable	B	SE	Wald	df	Significance	AOR (95% CI)
Unemployed	-0.186	0.350	0.282	1	0.595	0.831 (0.419-1.648)
Employed	-0.228	0.276	0.682	1	0.409	0.796 (0.463-1.368)
<b>BMI (kg/m<sup>2</sup>)</b>						
Obese	Reference					
Underweight	0.083	0.332	0.062	1	0.803	1.086 (0.567-2.081)
Normal	0.198	0.250	0.630	1	0.427	1.219 (0.747-1.989)
Overweight	-0.190	0.266	0.514	1	0.473	0.827 (0.491-1.391)

## DISCUSSION

Telemedicine was not popular prior to the pandemic in our region. But its scope has dramatically increased during COVID-19 pandemic. It gained popularity among patients and health care worker as an effective means of communication during these difficult times of pandemic when transportation was restricted. It was particularly effective in serving the people in remote areas where health care facilities are already sparse. Survey respondents indicated that the most significant benefit of telemedicine was decreasing potential virus exposure.

Maximum teleconsultation was taken by patients in age group 18-40 year. This is the same age group using technology more conveniently as compared to older age group. This age group similarly prefers and favors telemedicine approach for health care. Similarly, more teleconsultation was sought by urban population as compared to rural. Teleconsultation is more easily sought method of health care to employed population, implying the availability of telephone and internet facility to this subgroup. Males are more open to their health issues and comfortable in communicating the same on telephone as compared to females. This is reflected in our survey where males are more in favor of teleconsultation as compared to females (55.6% vs 43.1%).

Public transport was restricted during COVID-19 pandemic, increasing the cost of travel. This again points to the finding in our survey that teleconsultation was more used by urban population located distantly.

According to present study, 347 respondents found telemedicine more convenient than outpatient department (OPD) visit, 409 respondents consider telemedicine safer during the pandemic.

Cochrane systematic review of interventions for chronic pain in adults revealed a reduction in disease associated pain and distress in the tele-medicine group as compared to group who received physical care.<sup>4</sup> A study by Martorella et al demonstrated no difference in the treatment outcome between teleconsultation and physical consultation groups.<sup>5</sup>

In spite of all advances in mobile connectivity and network in the recent years, only 34.45% of the Indian population has access to internet services.<sup>6</sup>

Tele-consultations though convenient but has certain limitation. It reduces direct patient-doctor interaction, lack of physical examination which may lead to incomplete diagnosis and lack of personal caring touch and empathy towards patient's sufferings which may make patients apprehensive. Concerns related to the confidentiality of information shared by the patient is another drawback which needs to be addressed.

In spite of all limitations, téléconsultation has certain advantages particularly in Indian setup where health services are already overwhelmed. Tele health services may play a role in screening of patients who need a clinical visit by way of triaging thus prevents unnecessary visits to the hospital and restricts only to necessary physical consultation or emergency services, reassures the patient/caregivers of continued support from the care team, decreases the overall cost of treatment as it saves the cost of travel, and reduces waiting time of patients.

Another survey conducted in a palliative care center demonstrated that 54% (n=27) of the participants rated the tele-consultation "satisfying".<sup>7</sup>

A randomized control study reported patients who seek telemedicine avoided taking leave from work.<sup>8</sup> According to another study telemedicine reduces cost and saves time.<sup>9</sup> According to a survey conducted in 2019, 66% of patients participating in tele-consultation favored its use particularly younger patients.<sup>10</sup>

### Limitations

This is a single center study which may be biased towards a particular institution. Patients were selected randomly from a large group and approximately half of the patient's not responded and non-response may alter the result. Survey included few specialties; certain departments may have more favorable response as compared to others.

## CONCLUSION

This might be probably the first survey conducted in a tertiary institute in northern India to evaluate the efficacy of teleconsultation and assessing patient satisfaction and ease of use. Though there are certain limitations to this study, it provides an insight to the patient's perception towards telehealth facility.

The information gained from this survey may be used in future implementation of telemedicine services in regular practice and developing a robust and more efficient system. Patient's particularly younger generation, male gender and patients belonging from urban area who are more familiar with technology favored telemedicine facility. We need to curtail limitations of telemedicine and make a robust system while making use of the COVID-19 crises as an opportunity to strengthen the system that will stay for future.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Gupta AK, Paul S, Soni A, Kumar P, Nath B, Jotdar A. Patient's experience of tele-medicine during COVID-19 pandemic in a tertiary care centre in North India: a telephonic survey. *Int J Community Med Public Health* 2021;8:2517-22.