



PATIENT'S EXPERIENCE OF TELE-MEDICINE DURING COVID-19 PANDEMIC IN A TERTIARY CARE CENTRE IN NORTH INDIA: A TELEPHONIC SURVEY

Dr Amit Kumar Gupta Assistant Professor Department of general surgery. AIIMS Raebareli, India

Dr Sourabh paul Assistant professor Department of community medicine AIIMS Raebareli, India

Dr Annanya Soni* Assistant Professor, Department of ENT, AIIMS Raebareli, India.*Corresponding Author Email id: annanyasoni2004@gmail.com

Dr Pramod Kumar Assistant professor Department of general medicine AIIMS Raebareli, India

Dr Banashree Nath Assistant professor Department of OBG AIIMS Raebareli, India

Dr Arijit Jotdar Assistant professor Department of ENT AIIMS Raebareli, India

ABSTRACT **AIM:** 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.

SUBJECT AND 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 favourable attitude was 237 (51.3%) and not in favour 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. **CONCLUSION:** 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.

KEY WORDS : Tele-medicine; 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 population. 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 [Wu Z 2020].

The primary strategy was early diagnosis , patients 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 over burdened 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 gynaecology 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[Yip MP 2003; Parmanto B 2016]. Questionnaire had two parts: part 1 comprises of socio demographic variable of the participants and 2nd part comprises of questions for assessing attitude towards teleconsultation. 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.

*Corresponding AuthorDr Annanya Soni

Assistant Professor, Department of ENT, AIIMS Raebareli, India.

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 favourable (19-25) and unfavorable (5-18) considering the mean score of the participants. Favourable 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 was maintained during the entire study period.

RESULT

Total 463 individuals participated in this survey from April 18 to 31 august 2020. Demographic information from Patients survey group is summarized in table 1

Table 1: Demographic characteristics of the participants (N=462)

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

Table 1 shows that majority of the participants was from 18-40 yrs 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%).

patients survey response

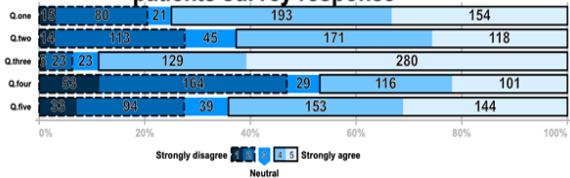


Figure 1: Response of participants towards attitude related questionnaire about tele consultation

Mean score of the participants' attitude towards online consultation was 18.52 ± 3.48 . Minimum score obtained was 9 and maximum 25. Considering mean score as cut off point for favourable and non

favourable attitude towards online consultation, Participants having favourable attitude was 237 (51.3%) and not in favour was 225 (48.7%). Figure 1 graphically depicts the participant's response through a likert plot.

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

SI No	Component	Mean score \pm SD
1	Telemedicine is much comfortable than usual OPD consultation	3.85 ± 1.151
2	Telemedicine and OPD consultation is same	3.58 ± 1.196
3	At the time of COVID pandemic telemedicine is more safe compared to regular OPD consultation	4.42 ± 0.893
4	I would prefer to visit regular OPD compared to telemedicine even in the time of COVID pandemic	3.10 ± 1.390
5	After COVID pandemic is over than also I would prefer to consult with the telemedicine mode	3.60 ± 1.303

Among 5 components for assessing attitude towards teleconsultation using 5 point likert scale maximum favourable score was obtained on the statement "At the time of COVID pandemic telemedicine is more safe compared to regular OPD consultation" 4.42 ± 0.893 and minimum was "I would prefer to visit regular OPD compared to telemedicine even in the time of COVID pandemic" 3.10 ± 1.390 . (table 2)

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

Variable	Attitude towards Online consultation		Chi square	P value
Age	Non favorable	Favorable	5.017	0.081
18-40	162 (47.8)	177 (52.2)		
41-60	46 (46.5)	53 (53.5)		
>60	17 (70.8)	7 (29.2)		
Gender				
Female	91 (56.9)	69 (43.1)	6.56	0.011
Male	134 (44.4)	168 (55.6)		
Locality				
Urban	145 (46.0)	170 (54.0)	2.824	0.093
Rural	80 (54.4)	67 (45.6)		
Education				
Up to matriculation	60 (50.0)	60 (50.0)	.475	0.788
Up to graduate	102 (47.0)	115 (53.0)		
Above graduate	63 (50.4)	62 (49.6)		
Occupation				
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)		
BMI				
Under weight (≤ 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 & above)	28 (49.1)	29 (50.9)		

Table 3 shows that age wise categorization 41-60 yrs age group had maximum favourable attitude (53.5%) towards online consultation whereas >60 yrs 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 favourable attitude towards tele consultation compared to female (43.1%) and this was statistically significant ($p=0.011$). Similarly urban participants (54.0%) and those had education up to graduation level (53.0%) had more favourable attitude towards tele consultation compared to others but this differences were also not statistically significant ($p=0.093$, $p=0.788$). Occupation wise categorization shows that students (58.8%) had more favourable attitude compared to others towards online consultation but this was not statistically significant ($p=0.145$).

Similarly BMI classification shows that under weight (54.9%) had maximum positive attitude towards telemedicine compared to others but this was also not statistically significant ($P=0.548$).

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)
Gender						
Female						Reference
Male	.628	.243	6.653	1	.010	1.873 (1.163-3.019)
Age						
18- 40 yrs	1.050	.483	4.729	1	.030	2.859 (1.109 – 7.368)
40-60 yrs	1.094	.505	4.693	1	.030	2.987 (1.110 – 8.040)
>60 yrs	Reference					
Locality						
Urban						Reference
Rural	-.443	.212	4.355	1	0.037	0.642 (0.424 - 0.973)
Education						
Upto matriculation						Reference
Upto graduate	.157	.275	.328	1	.567	1.170 (.683 – 2.005)
Postgraduat e & above	.091	.234	.152	1	.696	1.096 (0.692 – 1.735)
Occupation						
Student						Reference
Unemployed	-.186	.350	.282	1	.595	0.831 (0.419- 1.648)
Employed	-.228	.276	.682	1	.409	.796 (0.463 – 1.368)
BMI						
Obese						Reference
Underweight	.083	.332	.062	1	.803	1.086 (0.567- 2.081)
Normal	.198	.250	.630	1	.427	1.219 (0.747 – 1.989)
Overweight	-.190	.266	.514	1	.473	.827 (0.491 1.391)

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 R²) and 58.0% (Nagelkerke R²) of the variance of score of attitude 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 favouring or disfavouring online OPD consultation. Male participants (OR = 1.873, $p= 0.10$) and young (18-40 yrs) [OR = 2.859, $p= 0.030$] & middle age (40-60 yrs) [OR = 2.987, $p= 0.030$] participants had higher odds of favouring 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 the 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 .

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 were taken by patients in age group 18-40 yr. This is the same age group using technology more conveniently as compared to older age group. This age group similarly prefers and favours telemedicine approach for health care. Similarly more teleconsultation were 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 favour 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[Buhrman M 2016] . A study by Martorella et al. demonstrated no difference in the treatment outcome between teleconsultation and physical consultation groups.[Martorella G 2017]

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.[world bank data 2019]

Teleconsultations though convenient but has certain limitations. 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, teleconsultation 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 the waiting time of patients.

Another survey conducted in a palliative care centre demonstrated that 54% (n = 27) of the participants rated the tele-consultation "satisfying".[Shrikant Atreya 2020]

A randomized control study reported patients who seek telemedicine avoided taking leave from work [Viers BR 2015]. According to another study telemedicine reduces cost and saves time [Gunter RL 2016]. According to a survey conducted in 2019, 66% of patients participating in tele-consultation favored its use particularly younger patients [Telehealth index: 2019]

Limitations -

This is a single centre 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 favourable 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.

Conflict of interest- None declared.

Funding- No funds received for this work.

REFERENCES

1. Buhrman M, Gordh T, Andersson G(2016). Internet interventions for chronic pain including headache: A systematic review. *Internet Interv.* 2016;4:17–34. [PMCID: PMC6096254] [PubMed: 30135787]
2. Gunter RL, Chouinard S, Fernandes-Taylor S, et al (2016). Current use of telemedicine for post-discharge surgical care: a systematic review. *J Am Coll Surg.* 2016;222(5):915e927-. doi:10.1016/j.jamcollsurg.2016.01.062
3. Martorella G, Boitor M, Berube M, Fredericks S, Le May S, Gélinas C(2017). Tailored web-based interventions for pain: Systematic review and meta-analysis. *J Med Internet Res.* 2017;19:e385. [PMCID: PMC5701966] [PubMed: 29127076]
4. Parmanto B, Lewis AN, Graham KM, Bertolet MH(2016). Development of the telehealth usability questionnaire (TUQ). *Int J Telerehabil.* 2016;8(1):3-10. doi:10.5195/IJT.2016.6196
5. Shrikant Atreya et al (2020). Patients'/Caregivers' Perspectives on Telemedicine Service for Advanced Cancer Patients during the COVID-19 Pandemic: An Exploratory Survey. *Indian J Palliat Care.* 2020 Jun; 26(Suppl 1):S40–S44.
6. Telehealth index: 2019 consumer survey. 2019. <https://static.americanwell.com/app/uploads/2019/07/American-Well-Telehealth-Index-2019-Consumer-Survey-eBook2.pdf>
7. Viers BR, Lightner DJ, Rivera ME, et al(2015). Efficiency, satisfaction, and costs for remote video visits following radical prostatectomy: a randomized controlled trial. *Eur Urol.* 2015;68(4):729-735. doi:10.1016/j.eururo.2015.04.002
8. World bank data(2019) . <https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=IN&most recent value desc=true>
9. Wu Z, McGoogan JM(2020). Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention. *JAMA* 2020 Feb 24. [doi: 10.1001/jama.2020.2648] [Medline: 32091533]
10. Yip MP, Chang AM, Chan J, MacKenzie AE(2003). Development of the telemedicine satisfaction questionnaire to evaluate patient satisfaction with telemedicine: a preliminary study. *J Telemed Telecare.* 2003;9(1):46-50. doi:10.1258/135763303321159693—11.