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Original Research Article

Knowledge, attitude and perception of health care providers and their patients regarding "Telemedicine" for otorhinolaryngeal care during the COVID-19 pandemic

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ABSTRACT

Background: Telemedicine aids health care facilities in implementing response on otorhinolaryngeal care during the pandemic while also maintaining provision for essential health services. This study was taken up to highlight perception of doctors and patients and implementation benefit and drawbacks of telemedicine, despite the continuous effort to help reduce ailments of the patients via reduction in the in-person care during pandemic. Objectives were to assess knowledge, attitude and perception (KAP) among doctors and patients regarding telemedicine during COVID-19 pandemic. To determine the gaps and challenges experienced by the health care providers and the patients by telemedicine consultation.

Methods: Cross sectional study conducted among the 18 doctors and house surgeons in department of otorhinolaryngology, KIMS Bhubaneswar and 486 patients who availed telemedicine for consultation from these health care professionals. A semi structured, mixed questionnaire was used. First phase of study was when patient contacted the doctor over phone, second was when doctor called up the patient for follow up and third was when both the doctors and patients were contacted to take their feedback on the study and assess their KAP on telemedicine. Data was analysed using SPSS-23 and Pearson's correlation was used to determine any association.

Results: 81%, 78.5% and 65.2% HCPs had good knowledge, attitude and perception score regarding telemedicine while among the patients the scores for good knowledge, attitude and perception were 42%, 21.4%, 15.4%, respectively. 88% HCPs and 84.8% patients were satisfied with e-health and were willing to continue this technology.

Conclusions: The traditional clinic consultation has been modified during the pandemic to prevent and control transmission of the infection though it has both merits and demerits.

Keywords: COVID 19, Health care providers, Health care services, Otolaryngology, Perception, Telemedicine

INTRODUCTION

Corona virus disease was declared as a pandemic by WHO during the early 2020, and by then, approximately every country reported cases positive for this fatal virus. This disease outbreak originated in Wuhan, China, in December 2019, caused by severe acute respiratory syndrome coronavirus. The mode of transmission of this virus is believed to be primarily through saliva droplets or discharge from the nose when an infected person coughs or sneezes.[1] Transmission based precautions, when used alongside standard precautionary measures, namely hand hygiene, personal protective equipments, respiratory hygiene, physical distancing and aseptic handling of biomedical waste, can stop or slow down the spread of known or suspected infection.[2]

Every country developed its own timely strategy to combat the infection transmission, be it either by SMS (social distancing, masking, sanitizing), early diagnosis, treatment and contact identification, keeping a check on international travel or by reducing the physical contact of health care professionals with the patients in need of medical attention and advice by strengthening the modus operandi of telemedicine.[2] This mode of communication has gained significance like never before. The trend of out patient care delivery has been noted to have declined so as to avoid exposure to infections from the hospital environment and reduce opportunities of transmission.[3]

It has become evident that health care professionals providing Otorhinolaryngeal care are more prone to getting the infection as they are compelled to sit close to the patient and their field of work is mucosal surfaces which might harbour heavy viral load.[4] COVID-19 has been tagged as an upper respiratory tract infection with symptoms ranging from none to life threatening. Common symptoms being- cough, difficulty in breathing, fever, anosmia and loss of taste, while rhinorrhoea being less frequent. Symptoms in early phase of the disease are not that worrisome for the patient and would not intimidate to visit a hospital or clinic.[4] Consulting a doctor over phone is rather elected.[5]

In 2018, digitalization in improvement of public health sector was acknowledged by World Health Assembly.[6] It is seen that the framework for telemedicine aids health care facilities in implementing response on Otorhinolaryngeal care during the pandemic outbreak while also maintaining provision for essential health services.[5] Telemedicine is also referred to as e-health or tele health.[5-7] Like every coin has two sides, this method too faces challenges. Factors such as illiteracy, poor network and internet connectivity, inability to convey symptoms clearly, poor treatment compliance by patient, switching doctors, etc. have been the issues in this regard, mostly in the rural set up or middle/low-income countries. Despite of the continuous effort to help reduce ailments of the patients via reduction in the in-person care during pandemic, the implementation benefit and drawbacks of telemedicine are less highlighted. Documentation regarding its accuracy, effectiveness and validation remain scarce.

This study was taken up to assess the useful impact and popularity of telemedicine for Otorhinolaryngeal health care services (HCS) during the COVID-19 pandemic among the COVID cases and concludes addressing the experience and challenges faced by the health care providers (HCPs).

Objectives

Primary objectives

To assess the knowledge, attitude and perception among doctors and patients regarding telemedicine during COVID-19 pandemic. To determine the gaps and challenges experienced by the health care providers (HCPs) and the patients by telemedicine consultation.

Secondary objectives

To assess the socio demographic condition, symptoms and severity of disease of the patients availing telemedicine during the pandemic.

METHODS

This descriptive cross-sectional survey was conducted among the 18 HCPs of different cadres, in the department of otorhinolaryngology of Kalinga Institute of Medical Sciences, a tertiary care hospital in Bhubaneswar, Odisha and the 486 patients who availed telemedicine for consultation from these HCPs from March 2020 to April 2021. The hospital is well known for its purpose-built environment and services related to ENT, speech, hearing and balance. This study was part of departmental activity, conducted with due permission from the head of the institute and department, as an assignment for interns and post graduate students to assess popularity and perception on telehealth and thus, ethical clearance was waived off. The study began only after obtaining consent of the patient and HCP, and their confidentiality has been maintained.

The study targeted and included those patients who contacted the ENT specialists and the interns posted in the ENT department (who consented for the study) during the study period for consultation related to ear, nose, throat and head who are all together referred to as health care providers (HCPs). To be included in the study, the patient had to be having symptoms (for >2 days), age 20 years and more, irrespective of the gender, not engaged in any self-medication and those who consented to participate.

Interview tool

A semi structured, mixed questionnaire with 3 sections- patient information (socio demography, health and vaccination), knowledge, attitude and perception regarding telemedicine (with a special reference to COVID) and telemedicine experience (both HCP and patient), was used. A 3-point Likert scale was used to assess the knowledge (1 = very low to 3 = very high) where score ranged from 1-9. While attitude (2 items) and perception (8 items) were assessed by dichotomous variables (disagree=0, agree=1). Thus, score range for attitude and perception was 0-2 and 0-8, respectively. The tool was self-developed using references from similar articles from literature and tested for internal and external validity.[7-10] The tool was translated and back translated into the local language- Odia, for the ease of eliciting answers and for patient to comprehend the questions.

Moreover, the patient was asked to send clear pictures of signs and symptoms which required visual examination for appropriate medical management.

The study had 3 phases; the first phase was when the patient contacted the HCP. In this phase, study information was provided to the patient and was followed by consenting. The patients who did not give their consent to participate were excluded from the study. Tele consultation was provided along with a follow up date at an interval of 1 month. A total of 498 patients gave consent. The second phase was on the follow up date when the study participant and lab reports (wherever necessary) were reviewed. This call was done by the HCP who attended the patient in the previous phase. There was a loss to follow up of 12 participants mostly due to non-response and inadequate network connectivity. Hence, the study involves responses and data of 486 participants. These 2 phases were followed by a call a week later wherein the patients and HCPs providing telemedicine were asked to provide their feedback on their experience with and perception on tele health care by the co-researcher from department of community medicine, who was not involved in tele consultation. This aided in minimizing reporting bias.

Statistical analysis

Post data collection and sample assessment, the data was organized and coded in Microsoft excel sheet. Qualitative data were analysed thematically while quantitative data were analysed using descriptive statistics. χ^2 test and Fischer exact test were applied as appropriate and a p-value of <0.05 was statistically significant using SPSS 23 and Pearson's correlation was used to determine association between knowledge, attitude and perception, with p value of <0.001 considered statistically significant.

RESULTS

During the study period, a striking surge in the rate of telemedicine consultation was witnessed by the health care providers in the study which peaked in the month of May 2020.

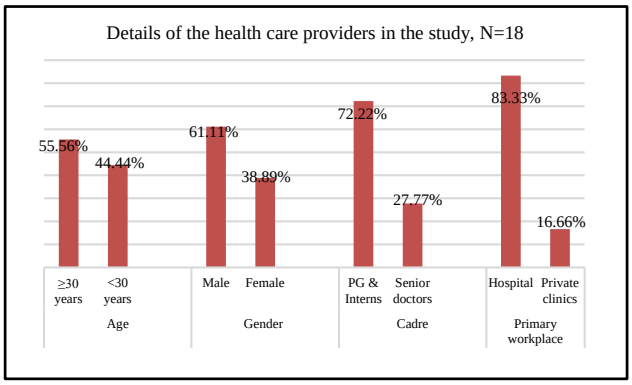

Figure 1: Details of the health care providers in the study (n=18).

Figure 1 represents the details of the health care providers who took part in the study.

Table 1 illustrates the characteristics of the 486 participants seeking health care via telephone. It was interesting to note that the most common age group utilizing this facility was 31-40 years and interestingly this was followed by the people of more than 60 years age group.

This study reports 38.68% patients from rural areas of India availing tele consultation which hints at the fact that Telemedicine has the potential to support delivery of health care services (HCS) to rural and difficult to reach areas. 52.25% of these rural patients must travel at least a distance of 10 km to receive basic HCS. On further enquiry, they report to spend major portion (25%) of their out of pocket expenditure into travelling in the last recent visit to a health care facility.

Table 1: Baseline characteristics of the health care seeker, n=486.

Variables	Frequency (%)
Age (years)	
<30	57 (11.72)
31-40	168 (34.56)
41-50	96 (9.75)
51-60	58 (11.93)
>60	107 (22.01)
Gender	
Male	312 (64.19)
Female	174 (35.80)
Residence	
Urban	298 (61.31)
Rural	188 (38.68)
Education (at least primary education)	382 (78.6)
Socio economic status	
Upper middle class	310 (63.78)
COVID-19 vaccination status	
Not vaccinated	189 (38.88)
Partial	245 (50.41)
Complete	52 (10.69)

This technology was found to be preferred more by the geriatric population (>60 years). Ageing people usually opt to get medical treatment at home and telemedicine can extend health care to patient's home.

The health care seeking practice was found to be statistically significant with history of chronic illness (>3 months of illness) (p=0.023). The common chronic illness reported were diabetes (35%), asthma (27.3%), chronic suppurative otitis media (27%) and hypertension (26.5%).

Figure 2 illustrates the status of the symptoms which were reported by the subjects at the time of tele consultation

and during the follow up after 4 weeks. It was witnessed that there is a striking improvement in health condition of patients with various symptoms after tele consultation.

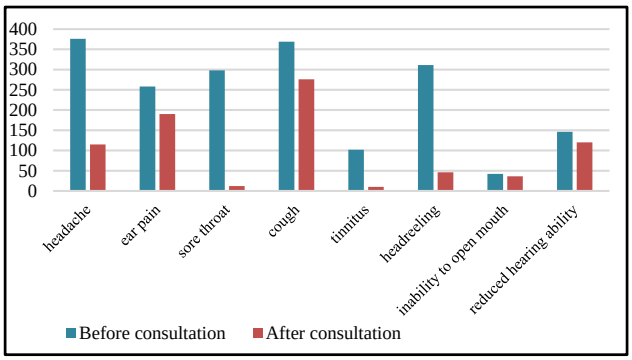

Figure 2: Otorhinolaryngeal symptoms prior to and after tele consultation (n=486).

Thus, it is evident that telemedicine stands to be efficient, effective and providing suitable patient care.

Knowledge, attitude and perception regarding telemedicine among HCPs

All the HCPs were exposed to telemedicine usage within 1 year prior to the study. 81%, 78.5% and 65.2% HCPs had good knowledge, attitude and perception score regarding telemedicine. Further analysis on perception showed no significance in association with age and cadre of HCPs. The HCPs perceptions are depicted in Figure 3. They were willing to introduce tele health in their practice.

Interestingly, it was found that only 18% had attended webinars/conferences related to telemedicine while a very few (9%) were aware of the new telemedicine guidelines.

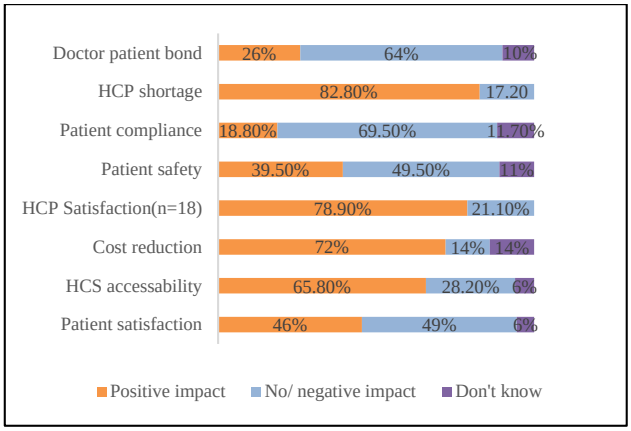

Figure 3: Perception of health care providers and patients on effect of telemedicine on health care delivery.

Knowledge, attitude and perception regarding telemedicine among patients

42% respondents had good knowledge on telemedicine while 21.4% had good score in attitude aspect and only 15.4% had a good perception score. Influence of gender on knowledge and attitude (willingness to adopt the practice) regarding telehealth was seen (Table 2). Knowledge on concept of telemedicine (p=0.015) and regarding its advantages and disadvantages (p=0.041) was found statistically significant with respect to gender of the patient. Attitude towards telemedicine was analysed at the end of the study, after collection of feedback from both doctors and patients. 88.5% HCPs and 84.9% patients were satisfied with e-health and were willing to continue with this technology. Moreover, 69.4% HCPs were willing to attend training on usage and management of telemedicine.

Table 2: Association of knowledge and attitude regarding telemedicine with gender of the patient (n=486).

Knowledge	Knowledge score	Gender		P value
		Male (n=312)	Female (n=174)	
Knowledge regarding concept of telemedicine	High (n=54)	50 (10.9%)	4 (0.8%)	p=0.015
	Average (n=162)	147 (30.2%)	15 (3.1%)	
	Low (n=270)	115 (23.7%)	155 (31.9%)	
Knowledge on usage of telemedicine	High (n=99)	96 (19.7%)	3 (0.6%)	p=0.142
	Average (n=204)	133 (27.4%)	71 (14.6%)	
	Low (n=183)	83 (17.1%)	100 (20.6%)	
Knowledge regarding its advantages and disadvantages	High (n= 206)	76 (15.6%)	4 (0.8%)	p=0.041
	Average (n=89)	154 (31.7%)	14 (2.9%)	
	Low (n=191)	82 (16.8%)	156 (32.1%)	
Attitude	**Attitude score**	**Education**		
		Literate (n=382)	**Illiterate (n=104)**	
Willing to frequently use telemedicine	High (n=413)	378 (77.8%)	35 (7.2%)	p=0.172
	Low (n=73)	4 (0.8%)	69 (14.2%)	
Willing to learn satisfactory usage of telemedicine	High (n=410)	326 (79.5%)	84 (17.3%)	p=0.059
	Low (n=76)	56 (11.5%)	20 (4.1%)	

Since other parameters were not significantly associated with KAP, detailed analysis of it has not been mentioned in this article due to space constraints. Further, the current study reports a significant difference in the knowledge across the SES groups (p=0.045).

On assessing the perception of HCPs and patients on the effect of telemedicine over delivery of health care, it was found that majority believed that this technology could bridge the gap between health care delivery and patients that has widened due to a shortage in count of health care providers and expensive health services in a developing country like India (Figure 3). Further, the patients responded that e-health would enable a larger population to have satisfactory and easy access to HCS. While majority of the doctors (78.9%) reported that it would also satisfy the requirements of health care providers to have access to patients in the difficult to reach areas. In the other hand both HCPs and patients were skeptical about patient's compliance to treatment and HCP's suggestion (69.5%) in addition to the bond between a doctor and his patient (64%).

Table 3: Association between knowledge, attitude and perception on telemedicine among patients.

Pearson correlation coefficient	Attitude	Perception
Knowledge	0.318*	0.218*
Attitude		0.166*

*Correlation is statistically significant at < 0.001 level.

Table 3 represents the association between knowledge, attitude and perception (KAP) on telemedicine among patients. Knowledge was more positively related to attitude, r(486)=0.318, p<0.001, than to perception r(486)=0.218, p<0.001.

Challenges

The qualitative analysis in the study focused on the challenges faced by the HCPs during implementation of telemedicine during the recent pandemic. The HCP undertaking telemedicine (N=18) reported challenges faced under 4 broad headings which were identified to be- lack of internet connectivity, lack of doctor- patient bonding, language barrier and noncompliance/adherence of the patient.

All the HCPs were using smart phones. Majority of them have reported loss of continuous internet connection as the greatest drawback of telemedicine in addition to noncompliance of the patient (Table 4). Moreover, over the phone, inability to explain regarding illness, caused disruption in efficiently delivering the health service.

Skewed distribution of telehealth facility was noticed in favour of patients from urban area which is attributed to the better internet connectivity and absence of language barrier in urban areas.

Table 4: Details of challenges experienced by health care providers and patients.

Variables	Frequency (%)
Health care providers (n=18)	
Lack of internet connectivity	16 (88.8%)
Language barrier	10 (55.5%)
Inability to explain over phone	14 (77.7%)
Unsatisfied bonding with patient	5 (27.8%)
Noncompliance of patient	16 (88.8%)
Patients (n=486)	
Unavailability of smart phones	350 (72.0%)
Internet network problem	421 (86.6%)
Difficulty in comprehending questions	250 (51.4%)
Language problem	322 (66.2%)
Inability to explain over phone	230 (47.3%)
Difficulty in smart phone usage	388 (79.8%)
Mental non-satisfaction	435 (89.4%)

DISCUSSION

COVID-19 is a highly contagious disease known to be transmitted through droplets from infected individuals.[4] During the pandemic, WHO recommended activities to halt that had potential to spread infection in mass crowd leading to the suspension of regular OPD services in hospitals.[11] This exacerbated the already prevailing issue of limited access to health care in India which prompted use of telemedicine as a serious and immediate response.[9] Furthermore, WHO recommends the doctor–population ratio to be 1:1000, while its present status in India is only 0.68:1000 and this hinders the supply of one to one health care.[12] This gap can be filled by adoption of tele health. A deep decline trend in hospital visits was witnessed during the pandemic.[13]

Certain specialties are most vulnerable to exposure and risk of contracting COVID-19, given their anatomical area of assessments. Evidence shows otolaryngologists to be the most at-risk physicians given their wide routine exploration of the throat, nose, ears, face, and the head and neck. The antecedent vulnerability to droplets from the patients is obvious. One of the proven precautionary practices to contain spread of the novel COVID infection is physical distancing. Hence, telemedicine among people and doctors came into sharp focus.[9,13]

Response of health care providers

A study conducted among health care providers on providing telemedicine services showed 78% respondents to be females[5] which contrasts with our study. In line with current findings, studies conducted among clinicians in Puducherry (59%) and Iran (96.1%) show inadequate knowledge regarding use of telemedicine.[3,8] The study conducted by Malhotra et al shows 43% healthcare students had insufficient knowledge while El Gatit et al

reported only 8.8% doctors to have good knowledge of telemedicine.[8,14]

Positive perceptions towards telemedicine affects its development.[5,7,8] In accordance with the findings our study, Galle et al report 23.2% HCPs to be unaware of telemedicine guidelines.[5] Their research also mentioned the challenges faced on using telemedicine which is consistent with the findings of current study, namely financial barrier, lack of infrastructure and doctor- patient bond.[5] Previous studies have shown lack of knowledge on telemedicine technology among the physicians is the greatest barrier which is consistent with our findings.[8,15] 90.9% medical students and doctors considered telemedicine as a viable approach and were willing to integrate it into their practice.[7]

On further enquiry, a few HCPs had attended webinars/conferences related to telemedicine which is in accordance with study findings of Malhotra et al. where only 13.1% medical students reported to have attended such sessions.[7] A study from West Bengal also reports only 14.7% post graduate students of a tertiary care hospital to have correctly defined "telemedicine".[16]

Telemedicine usage among patients

Studies have revealed limited use of telemedicine consultations among women similar to our finding but in contrast to a study done in Bangladesh.[5,17] Previous study in accordance to ours revealed that majority of the users were from urban areas and individuals with a higher income seemed more likely to be utilizing telemedicine services.[17-19] A similar finding has been observed in previous studies where this technology has also earned its position in treatment of chronic diseases.[20]

Taking feedback on telemedicine usage from the patients and health care providers, this study reveals their willingness to continue its use without any inconvenience. A study from Bangladesh shows 86.9% respondents considered telemedicine having the potential to play an important role in providing healthcare and most of them were willing to receive telehealth even after the pandemic which is in line to our findings.[17] A study reported different perceptions among people on use of telemedicine which was due to insecurity regarding the quality of in person care, adherence to care and any technical issue which stands similar to findings of current study.[21]

A study conducted among the medical students reveals knowledge among them was related to their willingness to adopt telemedicine which is similar to our finding that knowledge among the patients on telemedicine was more positively related to their attitude towards this technology in comparison to their perception.[7]

There are some limitations of this study. It would be more generalizable and useful if a larger sample of health care providers and seekers in more regions could be covered. As similar studies related to knowledge, perception and willingness among patients towards telemedicine are very less, this study is expected to contribute to reduce the gap.

CONCLUSION

Technology has both merits and demerits, and the main demerit envisaged is the gap in doctor and patient relationship. The diagnostic telemedicine is still largely in its development stage, with formidable handicaps in the areas of reimbursement, legislation, and malpractice issues yet to be overcome with exemption of teleradiology.

The benefits are beyond coronavirus pandemic and may include increased health accessibility, avoidance of unnecessary visits to doctors in hospital, saving costs of transportation and unnecessary health expenditure, and efficient use of specialist resources. However, further research in this field may eliminate the obvious drawbacks of telemedicine.

Recommendations

The traditional face to face clinic consultation has been modified during the pandemic to prevent and control transmission of the infection. An alternate method of that will prevent physical contact and still provide remote satisfactory clinical service (remote doctor–patient consultation) and effective medical outcomes is desirable. The platform is robustly presented by telemedicine. Medical personnel can utilize audio-visual real-time tools to assess their patients from the comforts of their homes. It will limit mass movement of the ill and their caregivers to the hospital, thereby preventing crowding which is inimical toward curtailing the spread of COVID-19.

Concerned regulatory authorities must increase awareness among public regarding telemedicine and strengthen ways to access it, in addition to reduction of cost to access telemedicine. This would help expand the use of electronic health information to track health statistics, development of policies to bridge the gaps identified in implementation of the existing health programs.

The health care personnel must be trained for utilizing the latest methodologies in the myriad of medical field to further enhance their knowledge and treatment skills, prior to promotion and implementation of such technologies as telemedicine on a large scale. The services should be made equally available and accessible to people without creation of an economical and technology-based divide.

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