

Telemedicine in Thai-otorhinolaryngology patients in COVID-19 situation; primary surveys

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Phoom Kooprom, Pannapa Wiriyamornchai and Alena Santeerapharp 

Abstract

Introduction: COVID-19 pandemic has put a strain on various aspects of hospital management due to high rates of infection and increased preventive measures around the world. Physicians and patients alike are susceptible to the ongoing virus causing concern leading to loss or postpone of follow up. Thailand has just start integration of digital solutions such as telemedicine which expected similar level of medical care and efficiency while reducing risk of exposure during the COVID-19 pandemic.

Objective: Evaluation the willingness to accept telemedicine in otorhinolaryngology patients during the peak COVID-19 outbreaks in our institution.

Methods: Collected data from all patients who had a schedule follow up for otorhinolaryngology department between the months of June to August, 2021 at out-patient Center.

Results: Total of 299 otorhinolaryngology patients included, 213 patients (71.2%) denied a virtual medical visit whereas 86 patients (28.8%) accepted. The obstructive sleep apnea (OSA) was the only group to have more acceptance of telemedicine, 79.5% than denying 20.5% with statistical significance ($p < 0.01$). Age difference between the accepting and declining group also showed statistical significance, 48.5 years and 56 years respectively ($p < 0.01$). Main Reasons for their decision, 48% of patients accepted due to experiencing clinical improvement and stability. The main reason for not accepting telemedicine was 80% of patients preferred a special otorhinolaryngologic examination on follow up.

Conclusions: This primary surveys among Thai otorhinolaryngology patients about telemedicine. The greater number of patients not interested in telemedicine due to requirement of otorhinolaryngologic examination. Which OSA follow-up patients have more attention in telemedicine.

Keywords

Coronavirus 2019, COVID-19, telemedicine, otolaryngology, virtual care

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Introduction

The current Coronavirus disease (COVID-19) pandemic has affected how physicians provide care to patients, preventing spread, and delivering primary healthcare has been a challenge. In order to minimize spread and improve efficiency of providing medical care, otorhinolaryngology department at our tertiary medical center has replaced a portion of physical doctor patient treatments with digital technologies, Telemedicine. Telemedicine or a virtual medical visit has been widely accepted and used

as an alternative official visit during the COVID-19 pandemic to deliver information, advice, diagnosis, and treatment.¹⁻³ In otorhinolaryngology, study suggests

Department of Otolaryngology-Head & Neck Surgery, Faculty of Medicine, Srinakharinwirot University, Bangkok, Thailand

Corresponding author:

Alena Santeerapharp, Department of Otolaryngology-Head & Neck Surgery, Faculty of Medicine, Srinakharinwirot University, Bangkok, Thailand.
Email: alena@g.swu.ac.th



telemedicine is efficient in providing medical care, reduce traveling costs, reduce exposure, and has obtained a certain level of satisfaction among patients without any serious disadvantages.^{4–7} In studies such as with treatment of diabetes, telemedicine showed no difference in results of treatment and satisfaction compared with normal annual follow ups.⁸ Studies also have shown that pediatric patients of otorhinolaryngology who have been prescribed antibiotics for treatment and had virtual medical follow ups shown no difference and no serious disadvantages as well.^{9,10} Major goals for implementing telemedicine are remote diagnosis, remote consultations, remote monitoring, remote intervention, and remote education.¹¹ In other countries such as China, telemedicine has been used to control and manage COVID-19, minimizing the number of new cases since March 2020 while providing virtual care and clinical examinations utilizing 5G technology.¹²

Telemedicine is the use of technology such as video or phone calls between a patient and their health care provider without being in the same room to provide care, advice, and services at a distance. Telemedicine delivers benefits both health and convenience to patients and doctors as well as reducing risk of exposure depending on the situation and nature of the disease. Telemedicine is accepted internationally but in otorhinolaryngology patients, some limitations would need to be put into consideration.

Our center, Her Royal Highness Princess Maha Chakri Sirindhorn Medical Center (MSMC) is categorized as a COVID-19 treatment center that constantly receiving referral patients from Bangkok and nearby provinces. During this time, patients other than the COVID-19 patients were at risk of exposure and had to be limited. Therefore, normal service and management had to be reduced or postponed to a later date. Especially, otorhinolaryngology patients who did not require time-dependent, or emergency management were all postponed and moved out to a later date. Together with the nature of otorhinolaryngology physical examinations, exposure during the nasal and oral examinations would pose a great risk to the physician as well as other patients, then Telemedicine was considered as an alternate option to reduce contact and spread of COVID-19. In this research, the number of patients receiving telemedicine as well as their satisfaction, concern, and willingness to accept would be collected. Statistical analysis of this data would be applicable for future considerations of telemedicine during pandemics or other natural disasters.

Materials and methods

This study protocol was approved by the Ethics and Humanity Qualification of University. (SWUEC-258/2564E) Information regarding telemedicine in otorhinolaryngology patients due to COVID-19 situation was collected at tertiary medical center from June to August of 2021.

All of Adult Out-Patient Department patients of otorhinolaryngology during these periods were included in this study which excluded patients with malignancies, upper airway obstructive diseases, emergency or critical conditions, time dependent treatment, and patients requiring immediate interventions. A telephone call asking people with recent symptoms, need to refill of current drugs, other abnormal manifestations, and willing to use further remote consultant as virtual meeting or video call via mobile applications.

Information was gathered during the duration of three from June until August of 2021. Data on patients including diagnosis, subspecialty, age, gender, payment type, underlying diseases, and willingness to accept Telemedicine was gathered through phone calls. Electronic Data was then statistically analyzed to obtain results on whether patients accepted or rejected the implementation of telemedicine during the COVID-19 situation.

Statistical analysis

All data were analyzed using SPSS Statistics (version 25.0; IBM). The continuous variables were reported as median with ranges (minimum–maximum). Normality was assessed. The comparisons of variables were performed using the nonparametric method with Mann-Whitney U test. Categorical variables were reported as numbers (*n*) and proportions (%), using two-tailed Fisher's exact for comparisons, unpaired t-test was used to determine the statistical significance between continuous variables, *p*-values ≤ 0.05 were determined to be statistically significant.

Results

A total of 299 patients with a mean age of 55 years were questioned. The total patients included was decreased in some part due to the exclusion criteria, however, being unable to contact patients contributed to the decrease in number as well. This could be due to the fact that contact information in the hospital database such as phone numbers or current addresses was not updated. Otorhinolaryngology patients varied in age, youngest at 18 years and oldest at 92 years. Genders did not vary much between female and male, 57.5% and 42.5%, respectively. A majority of patients were under the payment type of government enterprise officer which offered free treatment and medication to some aspects. Subspecialties for each otorhinolaryngology patients showed that most were receiving treatment for rhinology followed by otology, 32.8% and 21.7%, respectively. The final primary data obtained was whether the patients were willing to accept Telemedicine virtual medical visits as an alternative during the COVID-19 situation and future applications. A large majority of patients 213 from a total of 299, 71.2%

Table 1. Demographic data of all patients.

	Total (N)
Age median 55 y (18–92y)	299
Gender	
Female	172 (57.5%)
Male	127 (42.5%)
Payment type	
Welfare scheme	83 (27.8%)
Social security scheme	61 (20.4%)
Government enterprise officer	151 (50.5%)
Self-pay	4 (1.3%)
Subspecialty	
Rhinology	98 (32.8%)
Otology	65 (21.7%)
Head&Neck	52 (17.4%)
OSA	44 (14.7%)
Laryngology	24 (8%)
Miscellaneous	16 (5.4%)
Virtual medical visit	
Yes	86 (28.8%)
No	213 (71.2%)

OSA: obstructive sleep apnea

denied and were not willing to accept a virtual medical visit (Table 1).

Upon further comparison of each variable and subspecialty group, almost all denied a virtual medical visit. Variables of gender, age, and payment type all declined telemedicine with no group or subgroup supporting use of telemedicine. In the subspecialty group, however, OSA patients were the only group in this study that showed interest in accepting telemedicine. While all a large majority of other subspecialties declining telemedicine, 35 patients in OSA were willing to accept telemedicine compared to the nine patients that denied, 79.5% and 20.5%, respectively, with a statistical significance of $p < 0.01$ (Table 2). Subgroup analysis of subspecialties rhinology, otology, and head neck patients to separate each

diagnosis showed no acceptance of telemedicine as well (Table 3).

OSA subspecialty group, all 44 patients were non-sleep surgery patients that treated with pure CPAP. In 35 patients who accepted telemedicine, ages varied between 24 years and 78 years with a median age of 49 years, genders were 17 female and 18 male, 48.6% and 51.4%, respectively. About 23 of 35 (65.7%) OSA patients were willing to try telemedicine informed that during an annual follow up would mainly be receiving clinical evaluation without any special physical examinations with systems check of their continuous positive airway pressure (CPAP) machine that could see information via online. where 8 patients of the 35 patients, (22.9%) reported no clinical change. A final reason which 4 patients of the 35 patients, 11.4% stated was that they would like to try new methods of follow up that could benefit them in aspects of transportation, saving time and decreasing exposure. All 35 of the patients, 100% in the OSA subspecialty group were also in the government enterprise officer payment method group.

Telemedicine is a new concept to many of otorhinolaryngology patients, we would need to understand their reasons for accepting or declining a virtual medical visit. A total of 86 patients, 28.8% accepted telemedicine for three main reasons, trust in virtual medicine, annual follow ups not requiring special physical examinations, and clinically stable or improved patients. The main reason why 48% of the patients who accepted telemedicine was that there was improvement or stability in their clinical symptoms which did not need a visit to the hospital for follow up. The second reason with 29% of the patients stated was that they did not require any special physical examinations during their annual follow up, as seen with the OSA group in the previous results. Finally, 23% had a trust for virtual medicine which could be from personal past experiences or just a higher understanding of the current technological advancements (Figure 1). Age could be a variable in this area as the median age had statistically significant difference for the accepting group and declining group, 48.5 and 56 years, respectively.

On the contrary 213 patients, 71.2% did not accept the use of telemedicine. The main reason which 80% of the group mentioned was that they preferred or requested special physical examinations during their annual follow up. Special physical examinations in otorhinolaryngology such as nasal endoscope, flexible laryngoscope, audiograms, and etc. are done during annual follow ups of each patient. This was the main reason mentioned because patients felt that telemedicine could not offer the before mentioned special physical examinations causing patients to feel concern that a proper evaluation and follow up had not been done. The second reason that 14% of the group mentioned was the use of unfamiliar technology. Again, in this case, age could be an important

Table 2. Comparison patients who accept virtual medical visit in each variable.

	Yes	No	p-value
Gender			
Female	52 (30.2%)	120 (69.8%)	0.51
Male	34 (26.8%)	93 (73.2%)	
Age			
< 50 y (Median age = 35 y)	47 (41.2%)	67 (58.8%)	< 0.01
> = 50 y (Median age = 62 y)	39 (21.1%)	146 (78.9%)	
Payment type			
Welfare scheme	14 (16.9%)	69 (83.1%)	<0.01
Social security scheme	12 (19.7%)	49 (80.3%)	0.08
Government enterprise officer	59 (39.1%)	92 (60.9%)	<0.01
Self-pay	1 (25%)	3 (75%)	0.87
Subspeciality			
Rhinology	35 (35.7%)	63 (64.3%)	0.06
Otology	8 (12.3%)	57 (87.7%)	<0.01
Head&Neck	3 (5.8%)	49 (94.2%)	< 0.01
OSA	35 (79.5%)	9 (20.5%)	< 0.01
Laryngology	2 (8.3%)	22 (91.7%)	0.02
Miscellaneous	3 (18.8%)	13 (81.2%)	0.36

OSA: obstructive sleep apnea.

variable in accepting telemedicine as newer generations have a superior understanding of new technology. The final reason which 6% of the patients mentioned was having no telephone or equipment to participate in a virtual meeting. (Figure 2) Patients did not own a telephone or smart phone of their own or did not have any equipment that could allow them to participate in a video call. This could be due to the fact that the setting of our hospital was around 80 kilometers from the capital city, which meant some patients lived in rural areas. For many patients in these areas, smart phones or video calls were not required and in turn, many patients just did not own these types of devices necessary for telemedicine. Issues linked to internet access and Wi-Fi signals would also impact use of telemedicine which requires a stable signal for a videoconference call.

Discussion

Thailand was confronted with the coronavirus 2019 or COVID-19 pandemic situation, with its peak during June throughout August of the year 2021. During this period the number of confirmed COVID-19 new cases have drastically increased from at least two thousand cases at the beginning of June to a record high, at least twenty thousand new cases per day in August. The COVID-19 strain on treatment and hospital admission rates would increase as well as leading to a limited or decrease in hospital staff to account for increasing patients. Our medical center is categorized as a COVID-19 treatment center constantly receiving referral patients from Bangkok and nearby provinces. Our center had to reduced normal service and treatments of non-emergency or elective case to a later date.

Especially, the process of otorhinolaryngology physical examinations, exposure during the nasal and oral examinations would pose a great risk to the physician as well as other patients. our department had to postponed non-emergency surgery, all airway procedures as nasal endoscope, flexible laryngoscopy, in-office laryngeal injections, etc. should be done in negative pressure room. The negative pressure room was not sufficient for every procedure and

limited PPE (personal protective equipment), we had to limit the appointment of this procedure to five to eight patients a day, therefore the other out-patients would be affected by this situation. Consequently, Telemedicine was considered as an alternate option to reduce contact and spread of COVID-19. Telemedicine and postal delivery were considered because modern advances in online/internet access were available for all ages, gender, and provinces. As success in application of telemedicine meant that patients would have equal access to treatment and contact between doctor-patients and patient-patients would be decreased. Patient satisfaction, concern and availability with the newly implemented Telemedicine would have to also come under consideration as well.

Table 3. Subgroup analysis in rhinology, otology, and head&neck patients.

	Yes	No	p-value
Rhinology			
Allergic rhinitis (n= 72)	32	40	<0.01
Chronic rhinosinusitis (n=26)	3	23	0.04
Otology			
External ear disease (n= 11)	1	10	0.14
Middle ear disease (n= 16)	0	16	<0.01
Sensorineural hearing loss (n= 24)	5	19	0.37
Vertigo (n= 14)	2	12	0.22
Head & Neck			
Thyroid gland (n= 48)	3	45	<0.01
Salivary gland (n= 4)	0	4	0.2

There are numerous variables such as diagnosis, subspecialty, age, gender, payment type, underlying diseases, and willingness to accept Telemedicine all have an important role in patient acceptance of telemedicine. Patient who accepted telemedicine consisted of 28.8% of the total 299 patient data collected, of which a majority of the patients were OSA patients. OSA patients were more accepting of telemedicine 79.5% compared to 20.5% could be because there were no clinical changes and no special physical examinations involved during an annual follow up. There were also no concerns to check the CPAP machine if no problems during usage were found, which could be why telemedicine for this group was considered an acceptable option. Compared to other reports, OSA group trends to have a successful for telemedicine due to reduce indirect cost of treatment as travelling cost, wasting waiting time, etc.^{13,14} The main reasons for accepting telemedicine for the whole group of 86 patients was a stable or improved clinical symptoms, having follow ups with no physical examination required and a trust that virtual medicine. A

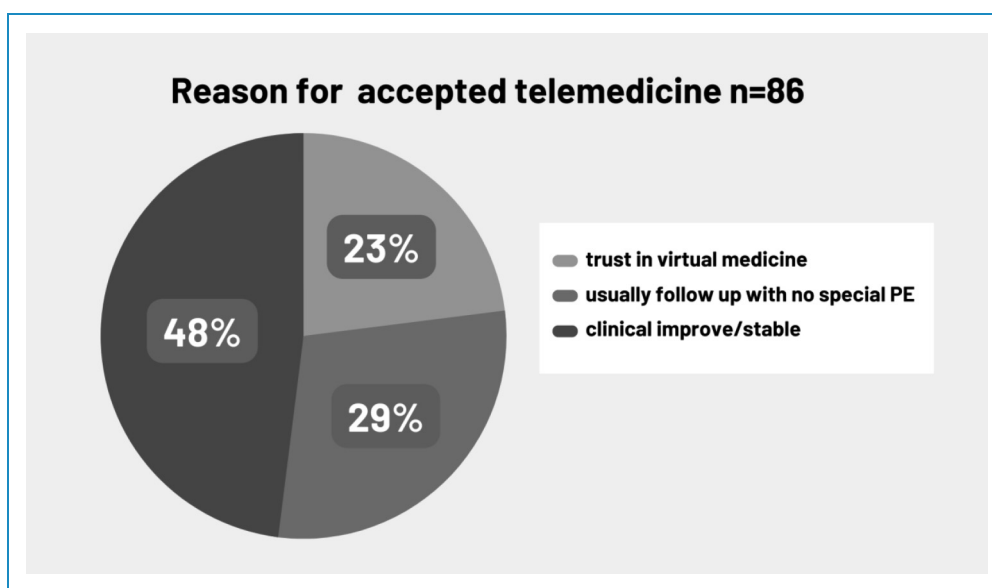


Figure 1. Reason for choosing telemedicine patients, N=84, median age 48.5 y (18-84). PE: Physical examination.

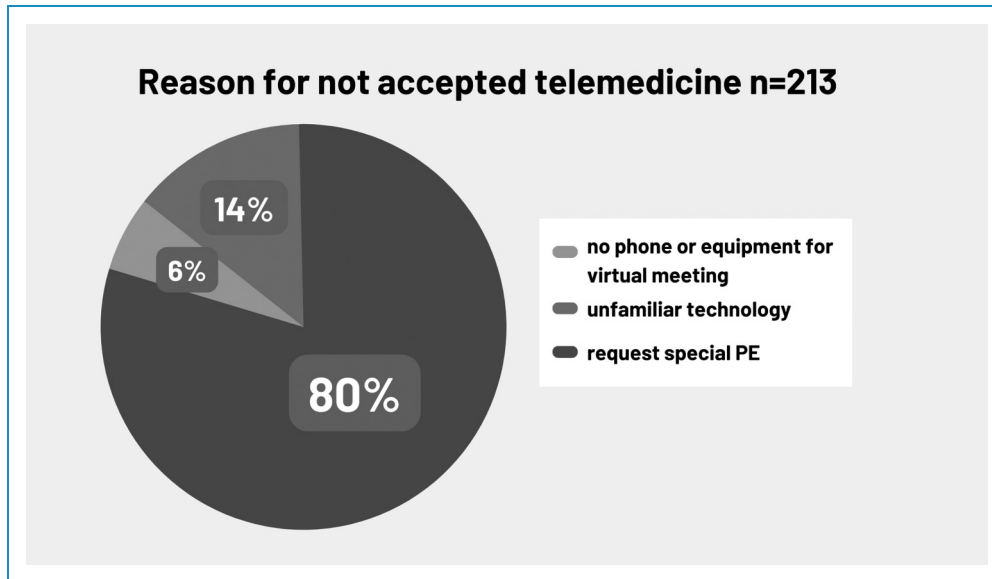


Figure 2. Reason for declined telemedicine patients, $N=213$, median age 56 y (18–92). PE: Physical examination.

statistical significance between the accepting and denying telemedicine groups was also the patient's age which could be an important variable, same as previous report shows younger patients would be more accustomed compared to older patients who have not had a chance to experience or learn to use digital technology.¹⁵ In this study a majority did not accept the implication of telemedicine as an alternative, 71.2% of patients who declined mainly due to requiring special physical examinations such as nasal endoscopy, audiogram, flexible video-laryngoscopy, etc., using an unfamiliar technology and access or equipment required for a virtual meeting was unavailable for them. The main differences of this study from other reports, the first is no primary care team or special home visit which could be the first introduction of telemedicine between primary care and tertiary center. Secondly, lack of high-quality equipment as and multi-disciplinary teams that would help patients felt familiar with telemedicine.^{16,17} Challenges to incorporate telemedicine such as acceptance, knowledge, and skills needed to operate will take time to acquire. Both patients and physicians would need to learn how to use the digital tools, especially older patients are least likely to use telemedicine and virtual applications which is why education and awareness of the benefits of telemedicine should be publicized.¹⁵

Compared to other studies, there are a wide range of opinions as to the regard of telemedicine. Telemedicine is not a new concept and has been used for many years, including success of telemedicine in previous managements of acute respiratory infections such as severe acute respiratory syndrome (SARS) and Middle East Respiratory Syndrome (MERS).¹⁸ The initial form of telemedicine involved the use of a telephone, video calls and other telecommunication applications were later incorporated to improve the efficiency.¹⁹ In this study phone calls to patients were applied

however video calls and other means of technology have not been used. Use of video calls and other technological applications could overcome many of the patients concern regarding physical examinations as physicians will be able to “have a look at the patient.” This would be a challenge in developing countries as rural areas lack sufficient technology to provide high quality images and video during virtual medical visits.²⁰ Another concern with using telemedicine which was not mentioned in this study was regarding patient privacy and data confidentiality.²¹ An obstacle to overcome when incorporating telemedicine at our hospital would also be the low expansion of internet networks²² in the rural area to provide quality videos and as before mentioned availability of digital technologies for patients. A study done in the United States found an increased level of interest by the population in telemedicine during the COVID-19 pandemic. It was met with a limit by the current telemedicine capacity which was not ready for such an increase in demand.^{23,24} Overall, if telemedicine is to be fully incorporated into the hospital it is important to start a clear framework or structure, obtain populations acceptance and probably funding to introduce appropriate technology and networking to rural areas.

In COVID-19 era that force us apart, lowering public exposure and increasing social distance between people. The technological advancements, the power of online platforms as telemedicine would bridge as these gaps. Understanding and thrust in virtual technology would be an important key in remote consultants. Outcomes of this study can be used to start giving telemedicine a role in Thai patients and help to improve quality of treatment, decrease traveling costs, save time, reduce exposure, and reach rural areas where medical services are scarce.

This limitation of this study in the aspect of gathering data is due to the single health care center in Thailand,

gathering of data and information will only be conducted using telephonic methods. Plans and methods to implement telemedicine would need to be applied and understanding of patient expectations would be needed for the achievement.

Conclusion

This primary surveys among Thai otorhinolaryngology patients about telemedicine. The greater number of patients are not interested in telemedicine due to requirement of special physical examination. Which OSA follow-up patients have more attention in telemedicine. Patient knowledge of telemedicine and most importantly patient trust need to be addressed. Preparation, education, and creating a clear framework for telemedicine might be necessary for future practices in Thailand during and post COVID-19.

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Guarantor: AS

ORCID iDs: Alena Santeerapharp  <https://orcid.org/0000-0001-5592-0849>

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