

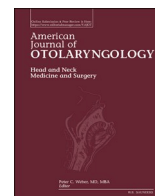


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Patient satisfaction with telemedicine in rhinology during the COVID-19 pandemic

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ABSTRACT

Background: The COVID-19 pandemic has forced the rapid integration of telemedicine services across several specialties, especially in Otolaryngology where risk of transmission is very high. Studies before and during the COVID-19 pandemic have shown that Otolaryngology is generally amenable to telemedicine. However, few studies have assessed patient satisfaction with telemedicine during the COVID-19 pandemic, and fewer have focused on patient satisfaction with telehealth in Rhinology.

Objectives: To determine if patients believe the benefits of virtual live synchronous telemedicine visits out-weigh the drawbacks when compared to in-person clinical visits.

Methods: Single center retrospective case series and survey study of patients presenting to a tertiary care Rhinology practice between 3/15/2020 and 6/1/2020. All patients had previous in-person encounters with Rhinology ($n = 45$).

Results: Twenty-nine participants (64.4%) had audio-video visits while 16 (35.6%) had audio visits. 36 (80%) patients stated that their needs were met during their telemedicine visit while 32 (71.1%) patients felt that nothing was missed or not addressed during the virtual visit. The most commonly cited advantage to telemedicine visits was convenience (22.2%) and provider availability (20.0%). While most participants did not disclose a disadvantage to a virtual visit besides the lack of a physical exam (68.9%), the most commonly cited disadvantage to a virtual visit was technological difficulties (17.8%).

Conclusions: Virtual telemedicine visits were shown to effectively meet the needs of established patients and address concerns in a convenient time efficient manner. However, patients indicated that limited technology and a less personalized feel hindered the telemedicine experience in Rhinology.

1. Introduction

The novel Coronavirus pandemic has impacted the lives and jobs of millions of individuals across the United States. Healthcare has also been significantly impacted by concerns over provider and patient safety. Otolaryngologists are particularly vulnerable to contracting and spreading the COVID-19 virus given the exposure to the nose and nasopharynx [1–3]. Per CDC recommendations, telehealth services including telemedicine have had a rapidly broadening impact on how healthcare is delivered in the US in several specialties [4]. As a result, telehealth and telemedicine have had an increasing role in several Otolaryngology practices, especially Rhinology [1].

The American Telemedicine Association officially defines

Telemedicine as “use of medical information exchanged from one site to another via electronic communications to improve a patient’s clinical health status” [5]. Telemedicine is a broad term and may be used to refer to live synchronous visits, asynchronous visits, digital transmission of medical imaging, and remote patient monitoring among many other modalities of patient care. Virtual visits, or live synchronous visits, offer a convenient, safe, and time-efficient method of delivering healthcare direct from provider to patient. In that sense, virtual visits have already been implemented in several surgical subspecialties even before the Coronavirus pandemic [6]. Despite several studies demonstrating that Otolaryngology is amenable to telemedicine, it has been less widespread in Otolaryngology than in other surgical specialties likely due to the need for physical examination, restrictions on use with new patients,

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and geographic restrictions on billing [7–9]. Previous studies have demonstrated that telemedicine reduces costs and the need for office visits in Otolaryngology [10–12]. Telemedicine has been shown to be effective in a relatively limited role before the pandemic such as in specialist consultation services and in delivering healthcare to remote locations [13]. Rhinology as a subspecialty has also been found to be amenable to telemedicine with the majority of sinonasal conditions being diagnosable via virtual visit [12].

The Coronavirus pandemic has caused a shift across numerous healthcare specialties towards a focus on ensuring safe and timely healthcare delivery through virtual modalities. Despite mounting evidence that these modalities work well in Otolaryngology, very few studies have explored patient satisfaction in live Telemedicine visits in the specialty, especially in Rhinology [14–18]. To the best of our knowledge, very few studies exploring patient satisfaction with virtual visits in Rhinology have been published. The objective of this study is to evaluate patient experience with virtual visits in Rhinology compared to their in-person clinical experience through an internally validated survey.

2. Methods

2.1. Telemedicine protocol

Virtual visits were conducted using one of two video conferencing platforms: Doxy.me (Doximity Inc.) and MDLive (MDLive Inc.). Both platforms conform with HIPAA requirements on protected health information. Visits were a part of an ambulatory care setting. Patients scheduled through central scheduling or by office secretary were asked about video capabilities to ensure synchronous audio-visual communications were possible. Patients that did not have video capabilities on their electronic devices or those that elected for audio only visits were contacted via telephone for their virtual visit. Providers were located at a clinical site during the virtual visits while patients were not located in clinical sites.

2.2. Study population

The target population for this study was patients with virtual visits with Rhinology during the COVID-19 pandemic that had a previous in-person Rhinology visit. This population was targeted in order to compare a patient's in-person experiences to their telemedicine experience and minimize the necessity of a physical exam. Study participants were identified using a two-step process. 193 patients at a single academic institution were identified as having had a virtual telemedicine visit with one of two fellowship trained Rhinologists. Individual patient charts were then examined to confirm reason for visit. Within the cohort, 55 patients did not have previous in-person clinic appointments with Rhinology, and were excluded. Of those with previous in-person rhinology visits, 31 patients did not have a listed email address and were excluded, 52 patients did not respond to email or telephone requests to complete the survey, and 10 patients declined participation in this study. Thus, 45 patients between the ages of 18–89 with follow-up telemedicine rhinology visits that responded to the survey were included in the study. This resulted in a 42.1% response rate for this survey among patients that were contacted.

2.3. Study design

This study is a single center retrospective case series and survey study of patients that had virtual telemedicine (either audio or audio-video) follow-up visits with one of two fellowship trained Rhinologists between 3/15/2020 and 6/1/2020 ($n = 45$). This study was approved by University Hospitals Institutional Review Board (IRB) (IRB#STUDY20200838).

Survey questions were constructed with a focus on validity, patient

experience with virtual telemedicine visits, and succinctness. The survey consists of 8 close-ended questions focused on patient experience and satisfaction with the virtual visit in comparison with in person clinic experience. Questions were asked to assess patient perception of communication during the virtual visit, whether patient needs were met, and whether the patient would participate in a virtual visit in the future. Three open-ended questions are included to assess patient opinions on the advantages and disadvantages of the virtual visit service as it is currently constructed, and changes that would improve this service. This 11-question survey was selected in order to maximize patient responses while also accurately assessing patient experiences with telemedicine through multiple question modalities.

2.4. Data collection

Patients identified for participation were initially contacted via email to inform them of study procedures and purposes of the survey. Participants were given an opportunity to withdrawal from survey participation. Participants were then sent the survey via email twice, separated by one week. Participants that did not respond to these emails were contacted via phone call to complete survey. Eligible participants received 2 phone calls separated by at least one week and at different times of day. Phone calls were made using Doximity dialer (Doximity Inc.) to allow the hospital number to be displayed on participant's phones. Demographic data was anonymously collected from patient charts.

2.5. Statistical methods

Demographic and clinical characteristics are presented using means with standard deviations, and frequencies with percentages are utilized for categorical variables. Categorical variables are compared using Fisher's exact tests due to low sample size. Additional comparisons among patient groups were performed using independent sample *t*-tests or chi-square analyses, as appropriate. All analyses were performed using Minitab version 19.1.1 (Minitab LLC, 2019). *P* values less than 0.05 were considered statistically significant.

3. Results

Forty-five patients with follow-up telehealth visits between 3/15/2020 and 6/1/2020 were successfully contacted and completed the provided survey. Twenty-nine participants (64.4%) had audio-video visits while 16 (35.6%) had audio visits. The most common chief complaint reported by patients was chronic sinus problems ($n = 18$, 40%). Ten (22.2%) patients did not specify a chief complaint on the intake form and thus were labeled as having an unspecified sinus problem. Forty-three (95.6%) patients had a nasal endoscopy performed before their virtual visit. The majority of patients in this cohort reported similar symptoms compared to their previous in-person visit (24, 53.3%), while 11 patients (24.3%) reported improvement and 10 patients (22.2) reported worsening of symptoms. The most frequent medication prescribed during the virtual encounters was steroids (12, 26.7%) and antibiotics (8, 17.8%). Six patient encounters (13.3%) resulted in decisions to undergo surgery while three encounters (6.7) resulted in referrals to physicians of other specialties. Demographics, chief complaint, percent of patients with previous nasal endoscopy, percent of patients with symptoms improvement, and visit results are demonstrated in Table 1. Thirty-six (80%) patients stated that their needs were met during their telemedicine visit while 32 (71.1%) patients felt that nothing was missed or not addressed during the virtual visit (Table 2, Fig. 1).

Participant responses to open ended questions about the advantages and disadvantages of the virtual visit as well as the changes to virtual visit coordination that participants feel would improve care are demonstrated in Table 3 and Fig. 2. The most commonly cited advantage

Table 1
Demographics.

Factor	Total (N = 45)
Age, mean ± SD	51.2 ± 16.0
Gender, No. (%)	
Female	31 (68.9)
Male	14 (31.1)
Chief complaint, No. (%)	
Chronic sinus problems	18 (40.0)
Nasal congestion	5 (11.1)
Nasal polyps	4 (8.9)
Nasal drainage	3 (6.7)
Cancer	2 (4.4)
Loss of taste	1 (2.2)
Mucosal thickening	1 (2.2)
Fracture	1 (2.2)
Previous nasal endoscopy, No. (%)	
Yes	43 (95.6)
No	2 (4.4)
Symptom progression, No. (%)	
Improvement	11 (24.3)
Worsening	10 (22.2)
Same	24 (53.3)
Visit result, No. (%)	
Steroids prescribed	12 (26.7)
Antibiotics prescribed	8 (17.8)
Saline gels prescribed	3 (6.7)
Anti-histamines prescribed	1 (2.3)
Parasympatholytic prescribed	1 (2.2)
Nasal cones prescribed	1 (2.2)
Surgery scheduled	6 (13.3)
Referral to other provider	3 (6.7)
None	17 (37.8)

Overview of participant age, gender distribution as well as primary diagnosis and complaints, symptom progression since prior visit, and visit results including medication prescription and surgery scheduling.

Table 2
Survey responses.

Factor	Total (N = 45)
Have you ever had a virtual visit (a live audio or audio-video interaction with a provider) prior to the coronavirus pandemic (prior to March 15th), No. (%)	
Yes	5 (11.1)
No	40 (88.9)
Has the coronavirus pandemic changed your desire to be seen in person by a provider? No. (%)	
Yes	21 (46.7)
No	24 (53.3)
Do you think anything was missed or not addressed because you were not seen in person? No. (%)	
Yes	13 (28.9)
No	32 (71.1)
Would you do another virtual visit in the future if the pandemic ends and you could be seen face to face in clinic? No. (%)	
Yes	35 (77.8)
No	10 (22.2)
Do you prefer the virtual visit experience to being seen in person, assuming the same quality of care? No. (%)	
Yes	17 (37.8)
No	28 (62.2)
Do you feel that your needs were met via virtual visit? No. (%)	
Yes	36 (80.0)
No	9 (20.0)
Do you feel that communication in your virtual visit was the same, better, or worse compared to being seen in person? No. (%)	
Better	4 (8.9)
Worse	12 (26.7)
Same	29 (64.4)

Overview of participant responses to close-ended survey questions.

to telemedicine visits was convenience (22.2%) and provider availability (20.0%). While most participants did not disclose a disadvantage to virtual visit besides the lack of a physical exam (68.9), the most commonly cited disadvantage to virtual visits was technological difficulties (17.8%). Furthermore, while most patients did not disclose a change to improve the telemedicine service (80.0%), the most commonly requested change was improvements in scheduling and coordination (8.9%) while 2 participants (4.4%) stated that technological changes would improve the telemedicine service.

Participant responses were also compared based on response to the question “Has the coronavirus pandemic changed your desire to be seen in person by a provider?” (Table 4) 21 participants (46.7%) stated that the pandemic has changed their desire to be seen in person. These participants were more likely to prefer the telehealth experience to being seen in-person (61.9%) compared to those whose desire was not impacted by the coronavirus (16.7%) ($p = 0.002$). There was no difference between these groups in regard to desire to do a future telemedicine visit (90.5% vs. 66.7%, $p = 0.055$) or perception of whether needs were met during the telemedicine visit (90.5% vs. 70.8%, $p = 0.100$).

4. Discussion

Before the onset of the coronavirus pandemic, few clinical practices saw a gradual integration of telehealth including telemedicine services to deliver efficient and cost-effective care. The COVID-19 pandemic has placed significant stress on the healthcare system, triggering a rapid adaptation of telemedicine programs in several specialties [19–21]. Virtual telemedicine visits offer a safe alternative for patients and physicians to in-person clinic appointments [1,21]. This safety is especially important in Otolaryngology, a surgical subspecialty that is particularly susceptible to contracting the novel coronavirus given consistent exposure to airways and nasal passages [1–3]. With the role of telemedicine rising in Otolaryngology, it is important to examine patient satisfaction in the specialty especially in less studied fields such as Rhinology.

The patient population targeted for this study offers a unique perspective into established rhinology patients’ experiences with telemedicine. All patients enrolled in this study had in-person visits with Rhinology before their telemedicine appointment. This allows patients to directly compare their telemedicine visit to their in-person visit and decreases the need for a physical exam, in particular a nasal endoscopy. This is supported in this study as over 95% of the patients included had nasal endoscopy performed during their in-person visit. From a physician’s perspective, it is clear that the providers conducting these virtual visits were comfortable prescribing a variety of medications, recommending surgery, and referring patients to other providers despite the virtual setting. The vast majority of patients in this cohort indicated that their needs were met and none of their concerns were missed or not addressed during their telemedicine visit. Furthermore, the majority of patient indicated a desire to have a future telehealth visit. The consensus among patients was also that communication in their virtual visit was the same or better compared to their previous in-person visit. From the patients’ perspectives, this demonstrates that virtual visit offered an effective method of healthcare delivery that addressed immediate needs without overlooking major complaints despite the lack of a physical exam. This is consistent with previous studies done on patient experience with telemedicine in Otolaryngology conducted by Rimmer et al. and Layfield et al. [14,15]. Rimmer et al. conducted a retrospective chart review and survey of 78 patients that had telemedicine visits from December 2015 to June 2017. In this study, 86% of patients agreed or strongly agreed with the statement that they received the same quality of care via telemedicine as they did an in-person visit. 95% of patients also indicated that they were satisfied overall with their telemedicine experience [15]. In a 2020 retrospective case series and patient satisfaction survey study of 100 patients that had telemedicine visits in a head and neck practice during the COVID-19 pandemic, Layfield et al.

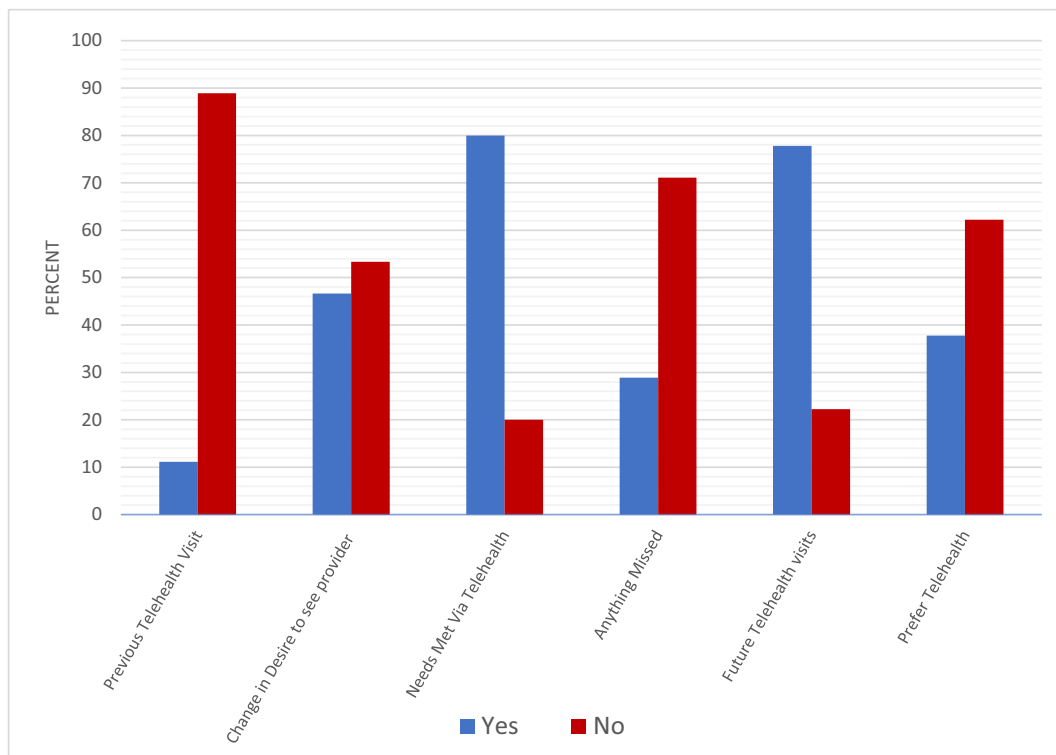


Fig. 1. Bar graph of participant responses to survey. Blue bar represents percentage of “yes” answers. Red bars represent percentage of “No” answers. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Table 3
Advantages, disadvantages, and changes to telemedicine visit.

Factor	Total (N = 45)
Advantages to telemedicine visit, No. (%)	
Availability of provider	9 (20.0)
Convenience	10 (22.2)
No time off work	4 (8.9)
No travel	5 (11.1)
Time saving	6 (13.3)
Safety	6 (13.3)
Visits not rushed	2 (4.4)
None	3 (6.7)
Disadvantages to telemedicine visit (other than lack of physical exam), No. (%)	
Technological difficulties	8 (17.8)
Less personal interaction	4 (8.9)
Poor communication	2 (4.4)
None	31 (68.9)
Changes to telemedicine visit, No. (%)	
Lower costs	1 (2.2)
Improved scheduling/coordination	4 (8.9)
Improved technology	2 (4.4)
Incorporation of diagnostic testing	2 (4.4)
None	36 (80.0)

Participant survey responses to free response questions on advantages and disadvantages of telemedicine visits, and changes that participants would like to see made to telemedicine coordination.

demonstrated that telemedicine was rated highly in multiple regards by patients [14]. In this study, patients on average gave overall satisfaction ratings of 6.29 out of 7.0. Satisfaction in this context included patient comfort with communicating using virtual platforms and willingness to use the service in the future [14]. Layfield’s findings closely reflect those of this study that patients not only communicated well with providers overall, but were willing to conduct future virtual visits. Furthermore, these studies conducted by Layfield and Rimmer support the findings in

this study that patients feel that telemedicine is an effective way to deliver care. The studies discussed differed from this study in two key aspects, namely they were performed within different subspecialties of Otolaryngology that require different levels of physical examination than in Rhinology and did not focus solely on patients with previous in-person Otolaryngology visits. However the findings of Layfield and Rimmer closely align with the finding in this study that telemedicine is an effective form of healthcare delivery in an outpatient Otolaryngology setting. Together with these studies, our data supports that established Rhinology patients are amenable to telemedicine services as a way to address their health concerns.

While this study demonstrates that the majority of patients feel as though telemedicine is suitable to meet their needs, some disadvantages to virtual visits compared to in-person visits were uncovered. The majority of survey participants (62.2%) indicated that they did not prefer the telemedicine experience to their in-person clinical experience. Inherent to the use of telemedicine is the inability to perform a physical exam. This is especially pronounced in Rhinology, a field that often relies on the use of specialized in-office technologies such as endoscopes for diagnosis and follow-up. This study also revealed other disadvantages to this healthcare modality from the patients’ perspective. These disadvantages include technological difficulties detracting from the patient experience as well as a less personalized feel to the telemedicine visit. Specifically, for synchronous video technology, the need for internet access and broadband connectivity is of significant importance in order to have a telehealth visit. These disadvantages and drawbacks mirror those established in a retrospective study on patient satisfaction with telemedicine during the COVID-19 pandemic conducted by Itamura et al. [22]. This study evaluated the experience of 195 patients with virtual visits and 4017 patients with in-person clinical experiences. Ratings for several categories involving communication and technology were low compared to ratings of in-person experiences including for ease of connection to the provider (65.6 out of 100), video quality (68.1 out of 100) and knowledge of medical history (64.7 out of 100) [23]. Itamura et al. corroborates some of the principle drawbacks of

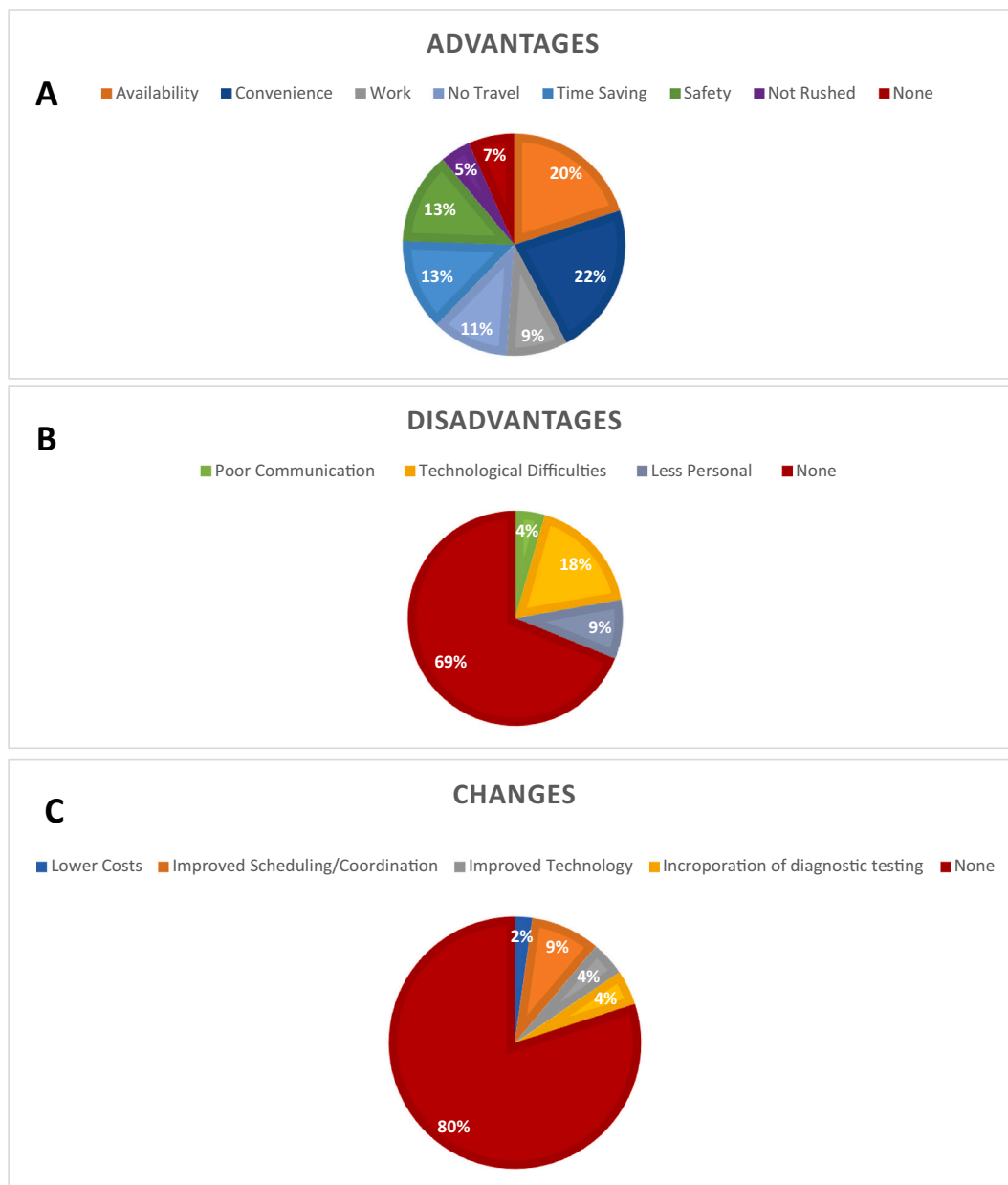


Fig. 2. Responses to free response questions on advantages (A) and disadvantages (B) of telemedicine visits, and changes that participants would like to see made to telemedicine coordination (C).

telemedicine including being limited by technology and lack of a personal environment. In the study by Layfield et al. the lowest rated metric studied was reliability. Specifically, patient rating for the question “I think the visits provided over the telehealth system are the same as in-person visits” were on average 4.02 out of 7. Together these studies demonstrate that overall telemedicine does have drawbacks especially when directly compared to in-person visits.

This study is not without limitations. Given the reliance of telemedicine on technology, patient experience is heavily biased by comfortability and access to technology. Not every patient could have a virtual visit with both audio and video technology and as a result patient responses and experience could be influenced by access to these resources. Another limitation is based on the sample size of the data. While the survey had over a 40% completion rate, the relatively low number of study participants decreases study power. This is due, in part to the limited timeline of this study as all patients must have had telemedicine visits between 03-15-2020 and 06/01/2020. Furthermore, the social

context of the COVID-19 pandemic also influences patient perception of telemedicine. Patients that indicated the COVID-19 pandemic did not change their desire to see a provider in-person were far less likely to prefer the telemedicine experience to the in-person clinical experience. Many negative responses to questions regarding the advantages and disadvantages to telemedicine were placed in a context of frustration that patients had limited access to in-person healthcare. Most patients were also unable to see physicians in person due to public health restrictions in place to protect patients and physicians. As such, it is difficult to assess the extent to which preconceptions of telemedicine and the influence of the pandemic on healthcare have on the patient experience.

5. Conclusion

The COVID-19 pandemic has caused rapid integration of telemedicine services in several Otolaryngology practices especially in

Table 4
Survey responses based on change in desire to see provider.

Factor	Change in desire to see provider (N = 21)	No change in desire to see provider (N = 24)	p-Value
Have you ever had a virtual visit (a live audio or audio-video interaction with a provider) prior to the coronavirus pandemic (prior to March 15th)			0.205
Yes	1(4.7)	4(16.7)	
No	20(95.2)	20(83.3)	
Do you think anything was missed or not addressed because you were not seen in person?			0.482
Yes	5 (23.8)	8 (33.3)	
No	16 (76.2)	16 (66.7)	
Would you do another virtual visit in the future if the pandemic ends and you could be seen face to face in clinic?			0.055
Yes	19 (90.5)	16 (66.7)	
No	2 (9.5)	8 (33.3)	
Do you prefer the virtual visit experience to being seen in person, assuming the same quality of care?			0.002
Yes	13 (61.9)	4 (16.7)	
No	8 (38.1)	20 (83.3)	
Do you feel that your needs were met via virtual visit?			0.100
Yes	19 (90.5)	17 (70.8)	
No	2 (9.5)	7 (29.2)	
Do you feel that communication in your virtual visit was the same, better, or worse compared to being seen in person?			0.146
Better	3 (14.3)	1 (4.2)	
Worse	3 (14.3)	9 (37.5)	
Same	15 (71.4)	14 (58.3)	

Participant survey response divided by change in desire to see provider. p-Values signify a 95% confidence interval: calculated with Pearson's Chi-squared.

Rhinology. In this retrospective case series and patient satisfaction survey, virtual telemedicine visits were shown to effectively meet the needs of established patient. Patient concerns were addressed in a convenient and time efficient manner, particularly patients who were concerned about an in-office visit due to the pandemic. However, patients indicated that limited technology and an environment that felt less personal hindered the telemedicine experience in Rhinology.

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