

Pediatric Ophthalmology Provider and Staff Attitudes and Patient Satisfaction in Telehealth Implementation During COVID-19

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Abstract

Purpose: Describe a comprehensive overview of a telehealth implementation process that highlights attitudes and satisfaction scores toward telehealth from patients, providers, and staff in an academic pediatric ophthalmology practice during the early months of the coronavirus disease 2019 (COVID-19) pandemic.

Methods: The electronic medical record data for telehealth and in-person visits, as well as a patient experience survey in pediatric ophthalmology were retrospectively reviewed for March 1 to July 31, 2020 and March 1 to July 31, 2019. Patient experience survey results were retrospectively reviewed. All current providers and staff were invited to participate in an anonymous and voluntary survey focused on attitudes at the time of telehealth implementation.

Results: During March 1 to July 31, 2020, there was significant increase in telehealth visits (n=1,006) compared with the same period in 2019 (n=22). Evaluation and management (E & M) codes (n=527) were the most commonly used billing codes, and strabismus, nystagmus, and irregular eye movement (n=496) were the most common telehealth primary diagnoses. The telehealth attitudes survey showed more positive responses from providers than staff. The patient experience survey showed more favorable scores for telehealth visits compared with clinic visits. However, only about 50% of the respondents were satisfied with the technology in terms of ease and quality of connection during their telehealth visits.

Conclusions: Telehealth was a satisfactory alternative to clinic visits in our academic pediatric ophthalmology practice during the early phase of the COVID-19 pandemic. Providers and staff had largely positive attitudes

toward telehealth; however, future efforts should include strategies to increase staff buy in. Patients had high satisfaction scores with telehealth visits despite connection challenges.

Keywords: provider and staff attitudes, patient satisfaction, telehealth, pediatric, ophthalmology, COVID-19

Introduction

The coronavirus disease 2019 (COVID-19) pandemic catalyzed a dramatic increase in telehealth services within the medical community by severely limiting in-person care. During the early months of 2020, many states, including Oregon, prohibited nonemergent in-person clinical care to protect providers and patients from the risk of COVID-19 transmission.¹ The U.S. federal government declared a public health emergency, initiating major policy revisions facilitating this growth, including increasing reimbursement for telehealth visits, facilitating interstate provider services, and by suspending Health Insurance Portability and Privacy Act rules limiting digital communications. The COVID-19 pandemic compelled solutions to insurance and state credentialing barriers for providers enabling an increase in telehealth.^{2,3}

Telehealth offers many potential advantages over in-person visits by providing service where there are provider shortages or where geographic, social, and other barriers limit access to health care.^{4,5} COVID-19-related restrictions may weigh most heavily on at-risk populations that are already experiencing significant barriers to care.⁶ Patients living in rural areas with geographic barriers to care may need to travel to urban settings to access specialty care, where COVID prevalence is often higher, and may need to utilize restaurants and hotels, further increasing exposure risks.^{7,8} In care settings such as pediatric ophthalmology where patients are often accompanied by family members, these additional family members may be at risk during a clinic visit. Well-developed telehealth systems may also offer a valuable resource when future pandemics or natural disasters prevent access to conventional clinical care. However, provider attitudes remain a primary barrier to expanded use.⁹⁻¹²

The purpose of this study was to evaluate attitudes toward telehealth among ophthalmology faculty and staff as well as patient satisfaction during the early months of the COVID pandemic and provide a comprehensive review of our pediatric telehealth expansion efforts. To accurately reflect provider and staff attitudes in our survey, we adapted three established tools (described in more detail in the Materials and Methods section) to measure individual and organizational predictors of adoption, as well as predictors of sustainability.

Materials and Methods

This study was conducted at Oregon Health and Science University (OHSU) Casey Eye Institute, the ophthalmology department at an academic medical center in Oregon. OHSU Casey Eye Institute provides primary eye care and is a major tertiary referral center in the Pacific Northwest and nationally. This study was approved by the Institutional Review Board of OHSU and conformed to the requirements of the United States Health Insurance Portability and Accountability Act. Informed consent was obtained electronically for participants in the provider and staff survey. Informed consent was waived for the retrospective chart review portions (telehealth adoption and patient experience).

TELEHEALTH ADOPTION

To study telehealth adoption and the characteristics of telehealth visits, electronic medical record data for telehealth and in-person visits in the pediatric and adult strabismus outpatient clinics of OHSU Casey Eye Institute were retrospectively reviewed. Patient visit data from the OHSU data-mart were pulled for the study period (March 1, 2020–July 31, 2020) and for the baseline period (March 1, 2019–July 31, 2019). This study period data included billing diagnoses, type of visit (in-office, synchronous audiovisual, audio only, imaging only, support staff only), date of service, age of patient at time of service, new/existing patient, home zip code, payor information, patient race and ethnicity, and patient and visit identifiers. The baseline period data included counts of in-person visits.

PROVIDER AND STAFF ATTITUDES TOWARD TELEHEALTH

All current employees of OHSU Casey Eye Institute were invited to participate in a survey about attitudes at the time of telehealth implementation. Survey questions included those about the participant's role and subspecialty. To measure the attitudes toward the contextual fit of rapid implementation of telemedicine, measures included in this survey were adapted from three established tools: the Evidence-Based Practice

Attitude Scale (EBPAS), the Organizational Readiness to Change Assessment (ORCA), and the Program Sustainability Tool.^{13–17} We defined contextual fit as need for intervention, training and resources available, organizational culture supports implementation, individual feeling of self-efficacy, beliefs in effectiveness, and sustainability. The EBPAS questions were focused on the individual predictors of adoption, the ORCA was adapted to measure organizational predictors of adoption, and the Program Sustainability Tool was adapted to measure predictors of sustainability. Invitations were sent through departmental communications with a link to the informed consent document for those interested in participation. Participation was anonymous and voluntary. Provider and staff survey data were collected and managed using Research Electronic Data Capture (REDCap) hosted at OHSU.^{18,19} REDCap is a secure web-based software platform designed to support data capture for research studies.

PATIENT EXPERIENCE

The distance from patients' home to OHSU's main campus was calculated using the ggmap R library using patient zip codes.²⁰ Patient satisfaction scores from OHSU's automated anonymous patient surveys were retrospectively reviewed for visits completed during the study period in the pediatric and adult strabismus outpatient clinics of OHSU Casey Eye Institute. Patient satisfaction was determined from a metric calculated from "OHSU Patient Experience," surveys administered by an outside entity, NRCHealth, Seattle, WA.²¹ The satisfaction metric used was the Net Promoter Score[®] (NPS), a singular metric used to track customer loyalty. This score is derived from the response to the survey question "How likely would you be to recommend this facility to your family and friends?" where a score of 0 being not at all likely and 10 being extremely likely. The NPS is calculated by subtracting the % of respondents that gave a score of 0–6 from the % of respondents that gave a score of 9 or 10.

Results

TELEHEALTH ADOPTION

During the study period of March 1, 2020–July 31, 2020, there were 3,310 office visits and 1,006 telehealth visits. In comparison, there were 5,929 office visits and 22 telehealth visits during the same time period in 2019. The timeline of telehealth adoption (*Fig. 1*) started in late March 2020 after administration began to curtail clinic visits on March 15. Telephone visits started on March 23 shortly followed by virtual video visits on April 3. On May 10, there was an initial increase of clinic volume up to 30% of baseline and on June 1, there was a second increase of clinic volume with physical

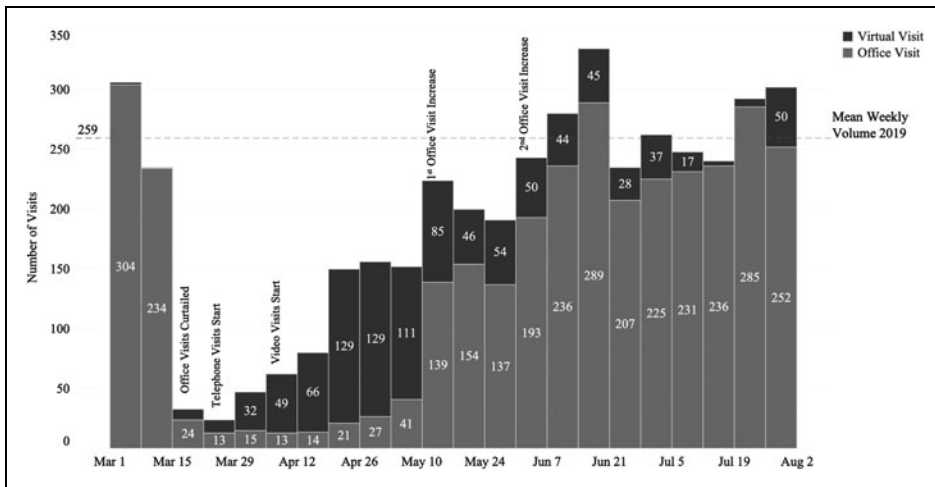


Fig. 1. Telehealth adoption from March 1, 2020 to July 31, 2020. After office visits were curtailed in mid-March, telehealth visits were initiated. In-person office visits were increased at the beginning of May and again at the beginning of June. By mid-July, the weekly volume of visits was similar to the mean weekly volume of the same time period in 2019 (baseline).

distancing and masking requirements. As the in-person clinic volume began to increase in May, telehealth visit volume started to decrease. The dotted line shows the mean weekly clinic volume (259 patients) from the baseline period: March to July in 2019.

Our pediatric division also adopted a hybrid telehealth model, where adult strabismus patients would first have an office visit with an orthoptist, who would bill for a sensorimotor examination. A clinician would then have a follow-up telephone or video virtual visit with the patient and bill for either the evaluation and management (E & M) or eye code and interpretation of the sensorimotor examination. During the study period, there were 49 hybrid visits and 957 virtual-only visits (Table 1). The most commonly used billing code (Table 1) for all telehealth visits (hybrid and virtual-only combined) was an E & M code for established patients ($n=449$), followed by an eye code for established patients ($n=286$).

The most common primary diagnoses seen on all telehealth visits were strabismus, nystagmus, irregular eye movements, or concern for these conditions ($n=496$), followed by amblyopia ($n=202$) (Table 1). There was also good representation of common pediatric ophthalmology conditions seen using telehealth.

PROVIDER AND STAFF ATTITUDES TOWARD TELEHEALTH

A total of 34 clinicians and 27 staff completed the survey about attitudes toward telehealth. The participant demographics are described in Table 2. Within the pediatric ophthalmology division, nine staff and all seven clinicians

completed the survey. The comprehensive ophthalmology and pediatric ophthalmology divisions comprised 31% and 26% of the survey respondents, respectively. Other subspecialties combined made up of the remaining 42% of survey respondents (Table 2).

The survey responses for all participating providers and staff were summarized in stacked bar charts divided into disagree, neutral, and agree response categories. Providers across the department of ophthalmology trended toward more positive (agree) responses, whereas overall staff trended toward more neutral responses (Fig. 2). Within the pediatric division, providers trended more positive than all OHSU Casey Eye Institute providers, and staff trended more negative (disagree) than all staff (Fig. 3). Of note, the survey prompt stating, “I prefer having telehealth visits over clinic visits” and “telehealth visits are supported by leadership,” received the most negative (19–21% strongly disagree) and positive (56–76% strongly agree) response, respectively, from both the providers and staff.

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PATIENT EXPERIENCE

The median distance of patients from the OHSU main campus for the time periods of March through July was lower for both in-person and virtual visits (office/virtual visit) in 2020 (37.69/50.81 kilometers) versus 2019 (47.28/69.77 kilometers). From the patient satisfaction survey completed by families who had visits during March to July 2020, the telehealth respondents gave a slightly more favorable score than office visit respondents (Table 3). This is specific to the question about likelihood of recommending either the institution or the provider to their friends and family. We did not have other parameters such as mean, average, or standard deviation available to determine whether the scores were statistically significant when comparing between the telehealth and office visit groups. Within telehealth respondents, 42% thought the method of connection was easy and 51% felt the quality of video/call was good.

Discussion

This study presents a comprehensive analysis of telehealth implementation in an academic pediatric ophthalmology and adult strabismus practice during the COVID-19 pandemic and has three key findings: (1) the pediatric and adult strabismus

Table 1. Characteristics of Telehealth Visits

TELEHEALTH VISIT CHARACTERISTICS	HYBRID	VIRTUAL ONLY
Number of visits	49	957
BILLING CODES		
Established patient E & M	6	443
Established patient eye code	14	272
Phone visit time billing	9	87
New patient E & M	2	76
Pre-/post-op	4	47
ROP telemedicine		30
Sensorimotor examination	28	
New patient eye code	14	1
Other	1	1
Not billed		3
PRIMARY DIAGNOSES		
Strabismus, nystagmus, and irregular eye movements	42	454
Amblyopia		202
Screening	5	61
Posterior segment		54
Eyelid or lacrimal system condition excluding ptosis	1	39
Cataract and disorders of the lens		40
Ptosis		31
Anterior segment		28
Other ocular condition		26
Glaucoma		24
Refractive error/accommodative condition	1	9

Telehealth visits included hybrid visits—in person sensorimotor examination with an orthoptist before the telehealth visit with the provider. The established and new patient E & M codes were levels 1–4, most commonly level 3. Eye codes were primarily 92012. The primary diagnosis delineates the first listed diagnosis in billing, or concern for a condition if none was found. E & M, evaluation and management.

department successfully adopted telehealth visits as a way to manage clinic restrictions during the COVID-19 pandemic in 2020, (2) provider and staff attitudes toward telehealth adoption were mostly positive, with staff being less positive than providers, and (3) patients’ overall satisfaction was maintained for telehealth visits during this time despite noted technical difficulties. Strengths of this study include exam-

Table 2. Participant Demographics

DEMOGRAPHICS	N	%
Consented	85	100
Participants (completing one or more questions)	61	72
Completed all questions	53	62
PARTICIPANTS BY DIVISION		
Comprehensive	19	31
Pediatrics	16	26
Satellite	5	8
Other	21	34
PARTICIPANTS BY ROLE		
Providers (MD/OD/DO)	34	56
Peds providers (MD/OD)	7	11
Staff	27	44
Peds staff (orthoptists+administrative staff)	9	15

Provider and staff telehealth implementation survey respondents. Peds, Pediatric.

ining various aspects of telehealth in one setting, including patient satisfaction, type and diagnoses of visits, implementation timeline and comparison of visit volume with baseline. In addition, this study provides a comprehensive assessment of provider and staff attitudes across ophthalmology, especially staff on the front line of implementation. This study speaks to the potential for telehealth within ophthalmology, but highlights the need for further studies to confirm satisfaction and applicability in other subspecialties.

The first finding was that our practice successfully adopted telehealth visits during the pandemic. Our practice was able to add telehealth visits soon after clinics were restricted in mid-March. By mid-April, clinic volumes were back to a little more than 50% of baseline due to telehealth visits. Return to baseline volume did not happen until in-person office visits were increased in May and June; at this time, the number of telehealth visits decreased to a small proportion of overall visits. Telehealth visits were used for a variety of care for common diagnoses and visit types, including hybrid visits where sensorimotor examinations were performed in person by orthoptists, followed by a virtual visit with a provider. Overall, these telehealth visits helped provide continuity of care for our patients and maintain revenue while in-person clinic visits were limited.

The second finding is that provider and staff attitudes toward telehealth were mostly positive, with staff being less

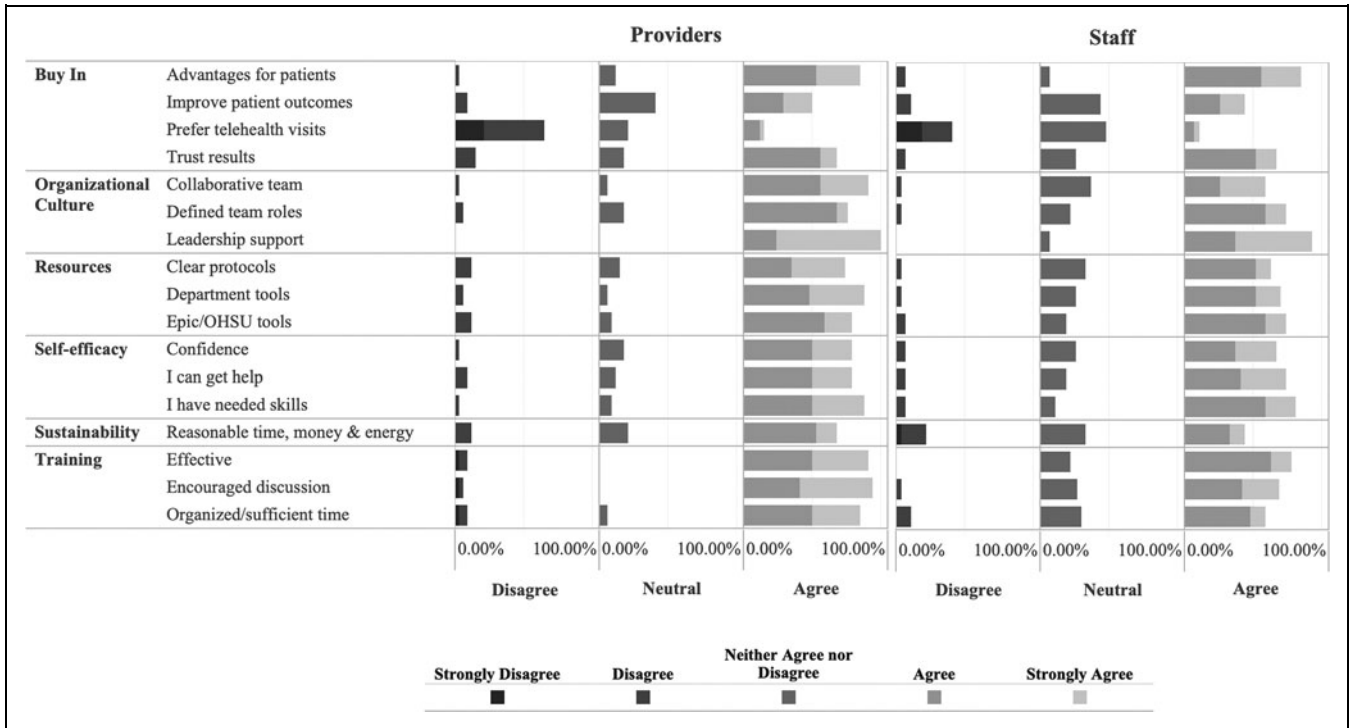


Fig. 2. Attitudes toward telehealth across the department of ophthalmology. The distribution of respondents' answers to survey questions is represented by stacked bar charts divided into disagree, neutral, and agree response categories. Overall, more staff reported neutral attitudes about telehealth than providers did.

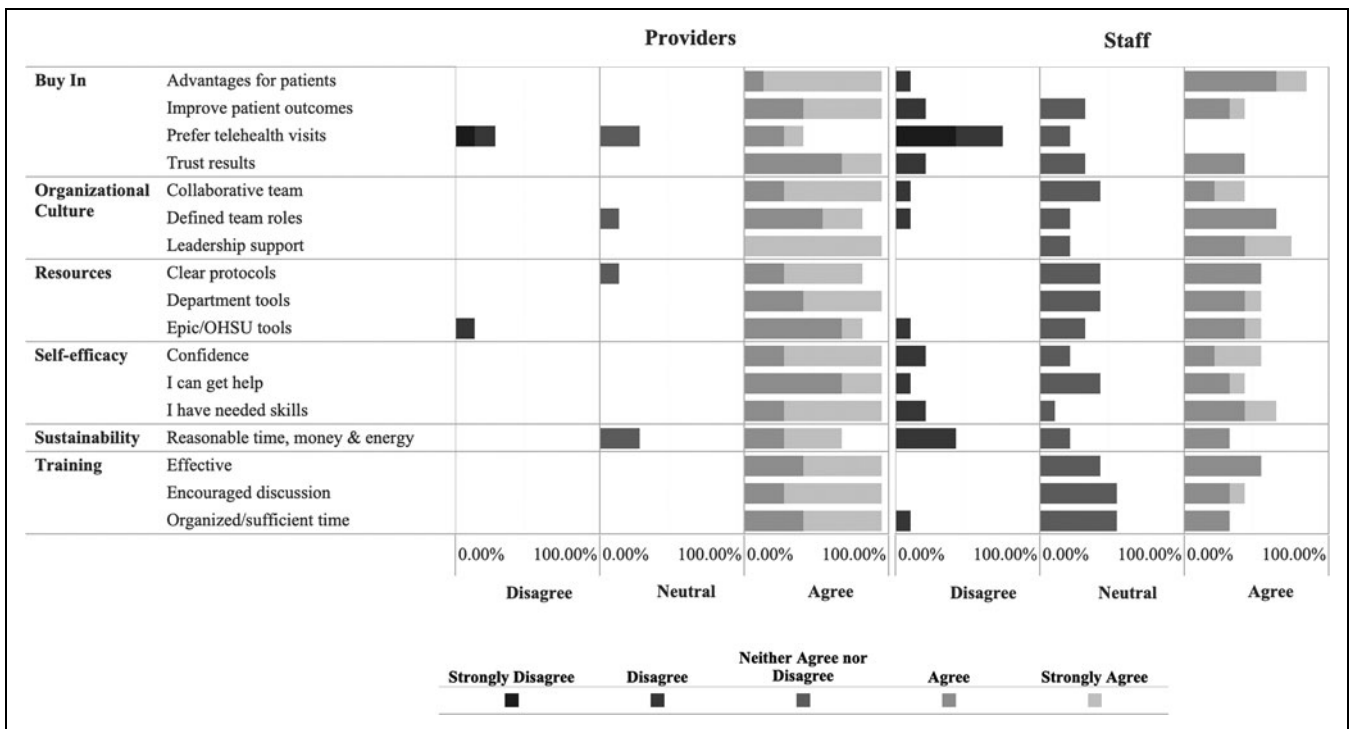


Fig. 3. Pediatric providers' and staff's attitudes toward telehealth. The distribution of respondents' answers to survey questions is represented by stacked bar charts divided into disagree, neutral, and agree response categories. Overall, more staff reported neutral attitudes and providers reported primarily positive attitudes about telehealth.

Table 3. Patient Satisfaction Scores

PATIENT SATISFACTION SURVEY QUESTION	IN PERSON 2020		TELEHEALTH 2020	
	SCORE	N	SCORE	N
Recommend institution	79.6	648	81.4	140
Recommend provider	86.4	674	92.3	143
Method of connection easy	NA	NA	42.3	130
Quality of video/call	NA	NA	51.2	129

The scores were taken from the NRC administered patient satisfaction surveys for in-person and telehealth visits during March–July, 2020.

NA, not applicable; NRC, NRCHealth, Seattle, WA.

positive than providers. The positive attitudes are similar to those seen in prenatal providers as they transitioned to telehealth during COVID-19.²² Staff attitudes being less positive than providers, especially within the pediatric division, may be explained by the increased time and administrative workload for staff implementing telehealth visits. The extra work for virtual visits included enrolling patients in a secure portal to access telehealth visits, assembling and mailing home vision testing kits, and troubleshooting with patients for internet connection or completing home vision testing. Streamlining this process will be important to reduce staff burden and improve staff attitudes regarding telehealth. Other articles have also reported reluctance of frontline staff to adopt telehealth as a new way of health care delivery, including concerns for workload, staff-patient interaction, and lack of clarity about duration and future.^{23,24} Addressing staff burden is essential to sustaining and expanding telehealth visits as part of the regular clinic workflow.

Despite the neutral to positive responses from both providers and staff on most of the survey, the prompt “I prefer having telehealth visits over clinic visits” received the most negative responses. One interpretation is that telehealth is viewed as an acceptable and temporary alternative to clinic visits, but not as a replacement. The question remains whether telehealth still serves as a sustainable alternative to clinic visit during normal operations or a longer shutdown.

The third key finding is that patients’ overall satisfaction was maintained during telehealth visits despite technical challenges. The patient satisfaction survey scores were about the same for telehealth and office visits even though about half of patients reported technical difficulties with connection and quality of a video/call. In addition, the median distance from patients’ homes to the main OHSU clinic decreased in 2020 for both telehealth and office visits, suggesting that the pandemic may have affected access to care for patients further

from the main campus, situated in a metropolitan area. Overcoming the technical challenges of telehealth and further investigating barriers to accessing care for distantly located patients will be important priorities for improving patient experience with telehealth in the future.

Limitations of this study include generalizability of our data to other ophthalmology subspecialty settings or fields of health care since this study focused on a pediatric ophthalmology practice in a single academic institution. Next, although the survey questions used in this study were drawn from previously validated survey instruments, our survey itself was not validated. In addition, the patient satisfaction survey was not designed specifically to measure patient attitudes toward telehealth; further studies will probe patient attitudes in more detail. Finally, our study did not address disparities such as socioeconomic levels, language and cultural differences that might influence telehealth care delivery; future research will address this important topic.

Our study shows overall feasibility and provides insights on telehealth use to expand access without additional physical space and for vulnerable populations. Other questions that need to be answered and could serve as future directions include the following: What is the best or most effective way to integrate telehealth into an office-based care model to improve care, minimize cost, and increase access to care? The hybrid telehealth model takes advantage of both modalities and would be an interesting concept to consider for future practice. A similar model has been described for telehealth in glaucoma practice.²⁵ As a new innovation, access to technology is a potential barrier to access virtual health care. In contrast, the same technology could also become a powerful tool to address other barriers to health care, such as transportation. For telehealth to be sustainable and widely adopted in our health care system, thoughtful planning is needed to reduce and not widen the health disparity gap due to technology access.

Conclusions

Telehealth is a satisfactory alternative to clinic visits in our academic pediatric ophthalmology practice during the COVID-19 pandemic. Examining provider and staff attitudes offers a realistic perspective regarding telehealth implementation and sustainability. Providers and staff have largely positive attitudes toward telehealth, with providers trending more positive than staff. Strategies to improve buy-in from both providers and staff should be considered with implementation. Despite the technical issues associated with telehealth visits, patients were overall satisfied with telehealth visits and have satisfaction scores equal or slightly higher than clinic visits.

Authors' Contributions

The authors each confirm and accept their status as authors based on the following criteria: (1) substantial contributions to the conception or design of the study; or the acquisition, analysis, or interpretation of data for the study; (2) drafting the article or revising it critically for important intellectual content; (3) final approval of the version to be published; and (4) agreement to be accountable for all aspects of the study in ensuring that questions related to the accuracy or integrity of any part of the study are appropriately investigated and resolved.

Disclosure Statement

The authors are employed by Oregon Health and Science University, which may gain or lose financially from the publication of the article. No funding source had involvement in the study design, analysis or interpretation of data, writing of the report or decision to submit this article. The authors have no other competing interests or personal financial interests.

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