

Understanding Patient Satisfaction: A Comparative Analysis of Telemedicine versus In-person Encounters in Pediatric Plastic Surgery

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Background: Telemedicine services experienced unprecedented growth during the coronavirus 2019 pandemic, offering patients remote access to care while minimizing exposures to possible infection. Our institution has one of the country's largest pediatric plastic surgery divisions and serves both a prominent metro area and sprawling rural community. Given the increasing utilization of telemedicine across several surgical subspecialties, this study aims to evaluate patient satisfaction following pediatric plastic surgery telemedicine encounters.

Methods: Press Ganey surveys were completed by parents or guardians of pediatric plastic surgery patients after in-person or telemedicine encounters with a single surgeon. Surveys were gathered from March 2020 to December 2022. Only 13 of the 25 survey questions were applicable to both in-person and telemedicine encounters and were included for analysis. Top box scores (the proportion of patients who selected the highest rating) were compared using Fisher exact test.

Results: Completed surveys were available for both groups from June 2020 to November 2022. A total of 223 surveys met inclusion criteria; there were 159 in-person encounters and 64 telemedicine encounters. Telemedicine encounters consistently had top box scores comparable to, or greater than, in-person encounters for all 13 survey questions. Statistically significant differences were observed for ease of contacting the practice ($P = 0.002$) and scheduling appointments ($P < 0.0001$).

Conclusions: Pediatric plastic surgery encounters completed via telemedicine demonstrate high patient satisfaction, exceeding in-person encounters for accessibility and convenience. Our study provides objective data about the patient experience and emphasizes the value of integrating telemedicine into pediatric plastic surgery practices. (*Plast Reconstr Surg Glob Open* 2024; 12:e6216; doi: 10.1097/GOX.0000000000006216; Published online 3 October 2024.)

INTRODUCTION

Telemedicine services experienced exponential growth during the coronavirus 2019 (COVID-19) pandemic out of a need to practice medicine safely.¹ Plastic surgeons faced unique challenges during this period due to an early moratorium on elective procedures, and were encouraged to embrace technology that previously held minimal clinical relevance in the field of surgery.² Although telemedicine

was initially used to minimize exposure to the COVID-19 virus, patients now have the opportunity to seek expert opinions remotely and discuss treatment options in the comfort of their own home.² Telemedicine also reduces time, travel, and cost commitments, which is especially beneficial to families of pediatric patients, considering over 17 million children live an hour or more away from a regional children's hospital.^{3,4} Telemedicine is thought to offer many potential benefits, including convenience for families requiring care on nontraditional schedules, minimizing absences from work or school, and improving access for children with special healthcare needs. Our institution (located in a large urban area) is one of the largest and most comprehensive specialty pediatric hospitals in the country, serving a vast rural community with a high volume of patient visits. Previous research from our plastic surgery division evaluated telemedicine use for simple postoperative encounters, revealing high

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patient satisfaction.⁵ Our study aimed to expand upon this research by comparing patient satisfaction following telemedicine and in-person encounters for pediatric plastic surgery patients across a broader range of diagnoses and visit types.

METHODS

Study Design

After obtaining approval from the institutional review board (#H-53010), a retrospective analysis was conducted of Press Ganey surveys routinely collected at our institution. The anonymous surveys were completed by parents or guardians of pediatric plastic surgery patients (aged 0–17 years) after in-person or telemedicine clinic encounters with a single surgeon. Patient experience personnel retrieved all available surveys between March 2020 and December 2022. Only months with completed surveys for both in-person and telemedicine encounters were included for analysis, as there was a period during which only telemedicine visits were offered. Supplemental information was obtained from clinic staff to characterize all scheduled telemedicine encounters according to primary International Classification of Diseases-10 diagnosis code and visit type (new, return, preoperative, or postoperative).

Press Ganey Survey

The Press Ganey survey is a validated tool designed to assess patients’ perceptions of care. It has been widely used for over four decades and is currently used by more than 41,000 healthcare facilities globally.⁶ The survey comprises 25 questions with a 1–5 Likert-type scale (very poor, poor, fair, good, and very good). The questions address various aspects of a typical clinic encounter such as access to care, events during the visit, assessment of the support staff, evaluation of the care provider, consideration of personal issues, and an overall assessment. Among the 25 survey questions, 13 are relevant to both in-person and telemedicine encounters and were included for analysis (Table 1). Among the 12 excluded questions, nine are specific to in-person encounters and assess overall clinic flow, clinic support staff, and physical safety. The remaining

Takeaways

Question: Does patient satisfaction differ between virtual and in-person pediatric plastic surgery clinic encounters?

Findings: A retrospective analysis of Press Ganey surveys completed by parents or guardians of pediatric plastic surgery patients revealed that telemedicine encounters consistently received top box scores equal to or greater than in-person encounters for all survey questions applicable to both modes of care.

Meaning: Pediatric plastic surgery encounters conducted via telemedicine demonstrate high patient satisfaction, surpassing that of in-person encounters in terms of accessibility and convenience, suggesting that telemedicine may be used in pediatric plastic surgery without compromising perceived quality of care.

three questions assess the quality of technology and are only applicable to telemedicine encounters.

The percentage of “very good” responses represents the top box score. For example, a top box score of 90% is achieved if nine out of 10 respondents select the highest rating for that question.⁷ Essentially, the top box score reflects the proportion of patients who give the highest rating or select the top available box as their response.⁷

Statistical Analysis

Press Ganey surveys were categorized based on telemedicine or in-person encounters. Top box scores were recorded as frequencies with percentages. Univariate analyses were conducted using Fisher exact test. Statistical analyses were performed with SAS, version 9.4 (SAS Institute Inc., Cary, N.C.). A *P* value of 0.05 was established as statistically significant.

RESULTS

Press Ganey surveys were retrieved for all encounters between March 2020 and December 2022. Completed surveys were available for both telemedicine and in-person encounters between June 2020 and November 2022. The remaining 4 months were excluded from analysis. During

Table 1. Press-Ganey Survey Questions Characterized by Relevance to In-person or Telemedicine Encounters

In-person Encounters Only	In-person + Telemedicine Encounters
Courtesy of registration staff	CP’s concern for your questions/worries
Information about delays	CP’s efforts to include you in decisions
Clinic wait time	CP’s discussion of proposed treatments
Concern of nurse/assistant for problem	CP’s explanations provided for problem/condition
How well nurse/assistant listened	CP’s information about medications
How well staff protected patient safety in the clinic	Degree to which clear language was used
Concern for patients’ privacy	Likelihood of recommending CP
Cleanliness of the practice	Ease of contacting practice
Felt safe in clinic environment	Ease of scheduling appointment
Telemedicine Encounters Only	Response to concerns or complaints during visit
Ease of speaking with CP over video	Sensitivity to patients’ needs
Video connection during visit	How well staff worked together to care for you
Audio connection during visit	Likelihood of recommending practice

CP, care provider.

Table 2. Diagnostic Categories of Telemedicine Encounters between June 2020 and November 2022

Diagnostic Category	New Visits (n = 301)	Return Visits (n = 437)
Subcutaneous lesions	85 (28.2%)	56 (12.8%)
Hand/foot	62 (20.6%)	30 (6.9%)
Cranial deformities	62 (20.6%)	31 (7.1%)
Cleft	6 (2.0%)	16 (3.7%)
Nasal	9 (3.0%)	13 (3.0%)
Ear	24 (8.0%)	27 (6.2%)
Breast	12 (4.0%)	16 (3.7%)
Wound/lacerations	9 (3.0%)	20 (4.6%)
Other (musculoskeletal, vascular, burns, facial trauma, other)	32 (10.6%)	47 (10.8%)
Postoperative (unspecified)	—	181 (41.4%)

the study period, 2927 encounters were scheduled, with 2189 completed in-person (74.8%) and 738 completed via telemedicine (25.2%). Among the telemedicine encounters, 301 were new visits and 437 were return visits (Table 2). The no-show rate for telemedicine encounters was 1.99% for new visits and 2.52% for return visits. The top diagnostic categories for new telemedicine encounters included subcutaneous lesions (28.2%), hand/foot concerns (20.6%), and cranial deformities (20.6%). Return telemedicine encounters were primarily scheduled for unspecified concerns (largely postoperative) (41.4%) or subcutaneous lesions (12.8%; Table 2).

The sample size was determined by a convenience sample of parents or guardians who completed a Press Ganey survey after their child's encounter. Of the 2927 encounters during the study period, a subset of 223 surveys was included for analysis (7.62%). Among these surveys, 159 were from in-person encounters and 64 were from telemedicine encounters.

Among the 13 questions relevant to both encounter types, telemedicine visits had top box scores equivalent to or greater than in-person visits. Only two questions demonstrated statistically significant differences between the two types of encounters: ease of contacting the practice ($P = 0.002$) and ease of scheduling appointments ($P < 0.0001$; Table 3). All questions about the care provider, personal issues, and overall assessment had no statistically significant differences between encounter types.

DISCUSSION

Telemedicine has increased substantially in recent years, largely driven by the impact of the COVID-19 pandemic. Initially adopted to mitigate the risk of infection, telemedicine has rapidly integrated into global healthcare systems, including surgical specialties.⁸ COVID-19 prompted governments, global partnerships, and various organizations to accelerate telemedicine adoption, especially in countries with robust infrastructure. Efforts are also underway in resource-constrained regions to secure political support and establish partnerships among stakeholders to promote economic growth, improve mobile device access, and enhance internet capabilities, thus expanding the reach and efficacy of telemedicine services.^{8,9}

In the United States, the Coronavirus Preparedness and Response Supplemental Appropriations Act, 2020, and the Coronavirus Aid, Relief, and Economic Security Act facilitated widespread implementation of telemedicine services by expanding coverage and flexibility for telehealth.¹⁰ Like many other healthcare systems, telemedicine has since been integrated into many of our institution's patient care models, including within the division of plastic surgery. This study evaluates patient satisfaction with clinic encounters completed virtually compared with in-person for a single surgeon and discusses the utility of telemedicine in pediatric plastic surgery.

No significant differences were observed in patient satisfaction for pediatric plastic surgery encounters whether conducted through telemedicine or in-person regarding quality of the provider, sensitivity to patient needs, response to concerns, and overall assessment. The surgeon received top box scores ("very good" responses) for nearly all questions, indicating high patient satisfaction for both encounter types. Telemedicine encounters were superior to in-person visits for ease of contacting the practice and ease of scheduling appointments.

While patients have the option to schedule appointments online or over the phone for both types of encounters, we suspect that telemedicine appointments are logistically easier to accommodate in a busy surgical practice. Therefore, patients experienced increased availability. It is also possible that, given telemedicine was in its infancy during the study period, there was an abundance of earlier time slots available. Patients may have found it easier to book appointments in those earlier time slots compared with waiting for an in-person encounter. Additionally, tech-savvy patients may find it more convenient to book appointments online and attend the encounter from the comfort of their own home. This translates to better scores when asked about ease of scheduling.

Our results indicate telemedicine may be used for pediatric plastic surgery encounters without compromising perceived quality of care or patient satisfaction. These findings align with previous research from our institution, which demonstrated high patient satisfaction with telemedicine encounters for uncomplicated postoperative visits. More than 90% of families described telemedicine encounters as convenient and thorough, with 92% willing to use the technology for future appointments.⁵

Table 3. Frequency and Percentage of Press Ganey Top Box Scores for Telemedicine and In-person Clinic Encounters

Survey Question	Telemedicine (n = 64)		In-person (n = 159)		P‡
	(n)*	n (%)†	(n)*	n (%)†	
Care Provider (CP)					
Concern for your questions/worries	64	61 (95.31)	159	143 (89.94)	0.289
Efforts to include you in decisions	62	59 (95.16)	157	143 (90.45)	0.412
Discussion of proposed treatments	63	60 (95.24)	159	145 (91.19)	0.408
Explanations provided for problem/condition	64	60 (93.75)	158	142 (89.87)	0.446
Information about medications	57	54 (94.74)	154	136 (88.31)	0.203
Degree to which clear language was used	64	61 (95.31)	159	145 (91.19)	0.407
Likelihood of recommending CP	64	60 (93.75)	159	148 (93.08)	1
Access					
Ease of contacting practice	64	54 (84.38)	158	101 (63.92)	0.002
Ease of scheduling appointment	64	60 (93.75)	159	102 (64.15)	<0.0001
Personal Issues					
Response to concerns or complaints during visit	63	59 (93.65)	156	133 (85.26)	0.112
Sensitivity to patients' needs	63	58 (92.06)	158	132 (83.54)	0.133
Overall Assessment					
How well staff worked together to care for you	64	59 (92.19)	157	136 (86.62)	0.357
Likelihood of recommending practice	64	59 (92.19)	158	142 (89.87)	0.801

Values in boldface indicate $P < 0.05$.

*Total no. responses to the survey question.

†Frequency and percentage of top box scores.

‡Fisher exact test.

Several other studies have examined telemedicine use in various pediatric specialties with similar results. Kennelly et al suggest telemedicine may be appropriately utilized for pediatric neurodevelopmental encounters, reporting no significant differences in patient satisfaction, and improved access for patients without specialized providers in their area.¹¹ Metzger et al surveyed parents and caregivers of pediatric general surgery patients, many of whom noted cost and travel time as substantial barriers to attending in-person appointments. Telemedicine encounters reportedly alleviated these burdens and offered a less stressful environment for their children.¹²

Although telemedicine was initially perceived as having minimal clinical relevance to the field of plastic surgery, it has since gained widespread acceptance, with many surgeons reporting favorable opinions toward telemedicine regarding its role in developing rapport and meeting goals of care.¹³ Plastic surgery patients have also expressed satisfaction with telemedicine experiences, noting comfort with virtual examinations and comparable care to in-person visits.^{14,15} Telemedicine has been successfully integrated into breast, cosmetic, and reconstructive practices for preoperative consults and routine postoperative visits.² It has also been used for wound and burn management, trauma settings, free flap care, and cleft lip/palate repair.^{2,16} In addition to providing increased convenience, telemedicine offers several benefits within plastic surgery including a reduction in unnecessary clinic visits, improved cost savings, and decreased gaps in care following referrals.¹⁷ Online visits also increase access to specialist care in rural and low-resource settings, which may facilitate improvements in triage decisions and postoperative monitoring.¹⁷⁻²⁶

Despite the proven benefits of convenience, access, and time/cost savings, there are distinct challenges

associated with using telemedicine in plastic surgery. The virtual physical examination is perhaps the most significant challenge for surgeons. Many initial consultations require plastic surgeons to manipulate and measure the patient's tissues for comprehensive diagnostic information and operative planning, tasks that cannot be performed through a virtual platform. Physical examinations conducted via photograph or video may be suitable for simple postoperative checks or initial consults before subsequent in-person examinations. However, complex postoperative examinations and urgent concerns are better suited to in-person encounters, where subtle clinical findings are less likely to be missed. There is also a potential for under- or overestimating the severity of a condition from a distance, which may result in unnecessary follow-up appointments, treatments, or procedures.²⁷ A 2021 survey involving plastic surgery patients and providers found that while telemedicine serves as a useful initial screening tool to rule out surgery, it is less suitable for determining the most appropriate procedure if surgery is indicated. Furthermore, both patients and providers expressed discomfort with virtual immediate postoperative visits due to limitations in tactile examination and visualization; however, virtual visits were deemed acceptable for long-term follow-up after the acute care phase. Additional challenges of telemedicine include technology issues such as delays in video transfer and poor audio quality, as well as potential inequities due to socioeconomic disparity, literacy barriers, or poor internet access.^{19,24,28}

Effective integration of telemedicine into clinical practice requires careful planning and strategy, particularly in specialized fields such as plastic surgery. Institutions and physicians should establish specific guidelines to determine patient eligibility for telemedicine visits, considering factors such as diagnoses, procedures, visit types, and

medical complexity. Surgeons must prioritize obtaining informed consent from patients and their families before proceeding with telemedicine visits, ensuring they are fully aware of potential risks, especially those concerning privacy and data protection. It is crucial to use only Health Insurance Portability and Accounting Act–compliant platforms to maintain cybersecurity, and patients should be advised against using public networks or conducting appointments in public spaces.²⁹ Additionally, emphasizing previsit preparation is essential, including detailed patient education on how to prepare for and conduct telehealth visits. Providing instructions on optimal lighting, camera angles, and contrasting backgrounds can enhance virtual physical examinations and improve the quality of postoperative photographs.

While our study provides valuable information about patient satisfaction with telemedicine in pediatric plastic surgery, it is important to acknowledge its limitations. A small proportion of total clinic patients completed and returned surveys, introducing the possibility of sampling bias. Additionally, the anonymity of Press Ganey precludes survey responses from being linked to specific encounters. Therefore, we were unable to assess the specific satisfaction of patients according to demographics, encounter types, or visit diagnoses. It is also important to note that this study is limited to a single surgeon at a single institution. Comfort with and adaptability to new technologies can vary greatly across individuals; therefore, our results may not be generalizable to the entire practice or to other institutions. It also remains to be seen if similar trends would be observed for surgeons with different baseline survey results for in-person encounters. Finally, this study was conducted in part during the COVID-19 pandemic, during which there was heightened public concern about transmission of illness. Positive experiences with telemedicine may, in part, be attributed to the gratitude felt by participants for avoiding potential exposure to a hospital environment for themselves and their children, or for their ability to continue receiving care during a pandemic. Further studies are ongoing to evaluate whether these trends in patient experience persist beyond the pandemic years.

Due to the anonymity of Press Ganey surveys, additional research is warranted to explore whether patient satisfaction with telemedicine encounters differs according to visit type, primary diagnosis, or surgeon. Future studies are also required to evaluate the impact of telemedicine on follow-up, with a focus on whether additional in-person assessments are indicated based on the quality of virtual encounters.

CONCLUSIONS

This study offers valuable insights into the utilization of telemedicine in pediatric plastic surgery, demonstrating equivalent or increased patient satisfaction with telemedicine compared with in-person encounters during the study period. These findings are consistent with existing research that supports the use of telemedicine in surgical subspecialties when appropriate. Our experience with integrating telemedicine into pediatric plastic surgery practices has been positive thus far, especially in rural and

low-resource settings, where this technology may improve access to care. While there are clear benefits of utilizing telemedicine, there are inherent challenges associated with integrating this technology into surgical practices. As such, surgeons bear the responsibility of frequent evaluation of patient satisfaction and outcomes to optimize telemedicine for the best possible patient care.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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