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Endocrine Surgery Patients' and Providers' Perceptions of Telemedicine in the COVID Era

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ABSTRACT

Background: Telemedicine has become a key modality for health care delivery during the COVID-19 pandemic, including for endocrine surgery. Little data exists on patients' and referring endocrinologists' perspectives of its use. The study aimed to assess and compare endocrine surgery patients' attitudes about telemedicine to that of referring endocrinologists.

Method: Patients from a regional endocrine surgery practice and referring endocrinologists were sent surveys about their perspectives on telemedicine use.

Results: Fifty two patients responded: average age was 58.3 years; 78% were female; 33% were Black. Sixteen referring endocrinologists responded: average age was 52.4 years; 62.5% were female. Nearly all patients (92%) and providers (100%) would try telemedicine or use it again. Providers were more likely than patients to use telemedicine because of COVID-19 (100% versus 70.6%, $P = 0.03$). Patients were more concerned about the lack of personal connection with telemedicine than providers (60.8% versus 25.0%, $P = 0.02$). Endocrinologists were more interested in using telemedicine to review abnormal results (81.3% versus 35.3%, $P < 0.01$), and more patients were specifically disinterested in reviewing abnormal results via telemedicine (54.9% versus 6.3%, $P = 0.04$). Patients were more interested in its use for postoperative visits (47.1% versus 0%, $P < 0.01$). More endocrinologists were specifically disinclined to conduct new consultations with telemedicine (87.5% versus 58.8%, $P < 0.01$).

Conclusion: Telemedicine is a mutually acceptable method for patients and their referring providers for endocrine surgery delivery, although in-person visits continue to have their place. Telemedicine use may continue to expand after the pandemic as an important point of access for endocrine surgery.

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Background

The Institute of Medicine defined telemedicine as "the use of electronic information and communications technologies to provide and support health care when distance separates participants."[1] Its application encompasses a wide range of situations and specialties including surgical specialties.[2] Due to the coronavirus pandemic of 2019 (COVID-19), the federal government incentivized telemedicine use to decrease transmission of the virus and lessen the burden of hospitals while still providing care: extended telemedicine benefits to both original Medicare and Medicare Advantage recipients; relaxed laws around software-based violations of the Health Insurance Portability and Accountability Act (HIPAA) as well as laws pertaining to providing care outside of state boundaries; and the approved $200 million COVID-19 Telehealth Program aimed at improving telemedicine access for low-income Americans.[3] Since March 2020, telemedicine visits increased by more than 20-fold in the United States when many geographic areas went into a shelter-in-place order in response to COVID-19.[3,4]

Existing literature demonstrated the time-saving and financial benefits of telemedicine in endocrine surgery departments.[5,6] With telemedicine, postoperative patients could potentially save traveling distance and time.[2] Although telemedicine reimbursement rates are lower than in-person reimbursement, physicians may be able to see more patients in a given day because telemedicine visits tend to be shorter in duration, which increases the time available for in-person visits.[5] Endocrine surgery patients are attractive candidates for telemedicine because it has low surgical complication rates.[7–14] As endocrine surgeons navigate clinical care during the pandemic and beyond, we have relatively little data on the perceptions of telemedicine use among key stakeholders: that of our patients and our referring endocrinologists, and how they compare. Prior to March 2020 our practice did not include the use of telemedicine, but afterwards it comprised 16% of our clinic visits. It was unclear how our stakeholders would respond to the technology. This information could allow surgeons to create a clinical approach to include telemedicine as a tool for endocrine surgery care delivery, where its role may persist beyond COVID-19.

To help fill this knowledge gap, the current study aimed to evaluate and compare endocrine surgery patients' and endocrinologists' attitudes on telemedicine use, in the setting of the COVID-19 pandemic. We hypothesized that patients would be receptive to using telemedicine as an alternative to in-person clinic visits and that patients' perceptions of telemedicine use would align with that of endocrinologists.

Methods

This was a cross-sectional survey-based study targeting adult patients of the MedStar Washington Hospital Center Endocrine Surgery Section, which serves the metropolitan Washington, DC area. Eligible patients cared for between March 1, 2019 and February 1, 2020 were included in this study because they were recent patients with whom the surgeons still have a relationship with and to promote inclusion of minority groups traditionally under-represented in clinical studies.[15–17] A letter that explained the study and included the survey were mailed to eligible patients between March and May of 2020 at the start of the pandemic spreading widely in the United States. A return envelope for the anonymous responses was included. The patient survey consisted of 1 open-ended and 23 multiple choice questions. We included the following validated quality of life questions from the Patient-Reported Outcomes Measurement System (PROMIS): PROMIS Scale v1.2—Global Health Physical 2a and PROMIS Scale v1.2 – Global Health Mental 2a. All other questions were de novo for the study. Given the large number of eligible subjects and the anonymous nature of the responses, we were not able to send targeted reminders or avoid the risk of patients responding more than once.

To gather the perceptions of referring physicians, endocrinologists were emailed a link to an anonymous survey in April 2020. A reminder email was sent to all approximately one month later. The physician survey consisted of 1 open-ended and 15 multiple choice questions. All questions sent to endocrinologists were developed de novo.

We compared the responses to questions that were given to both the endocrinologists and patients. We analyzed demographic data and performed sub-analyses of the patient responses, stratifying by age, gender, and race. Using the SPSS statistical analysis software (IBM Corp. Released 2016. IBM SPSS statistics for Windows, Version 24.0. Armonk, NY: IBM Corp), we performed Fisher's exact test for nominal variables. Regarding to continuous variables, we used One-Sample Kolmogorov-Smirnov test to determine normality. If the null-hypothesis was rejected, then we employed One-Sample Wilcoxon Signed Rank test to compare against a population mean. Statistical significance was set at $P < 0.05$. PROMIS Scale v1.2—Global Health Physical 2a and PROMIS Scale v1.2 – Global Health Mental 2a were scored using the HealthMeasures Scoring Service (https://www.assessmentcenter.net/ac_scoringservice). The study was approved by the Medstar-Georgetown Institutional Review Board, who waived the requirement for a separate informed consent.

Results

We mailed 489 surveys to patients and received 52 completed surveys (response rate = 10.6%). We emailed 183 surveys to physicians, and received 16 completed surveys (response rate = 8.7%). Among patients: mean age was 58.3±13.4 years; 78% ($n = 40$) were female; 63% were White and 33% were Black (Table 1). Among physicians: mean age was 52.4 years and 62.5% were female.

To understand the patients' social backgrounds, we inquired about access to transportation and technology (Table 1). Nearly all patients (92.1%) reported that access to transportation to seek medical care was either "not hard at all" or "not very hard." Nearly all patients (96.1%) also reported having regular access to the internet and a computer. Most patients (86.3%) had access to any type of cellular phone, including access to smartphones (84.3%). Regarding patients' quality of life, the median T-scores for physical (43.0, in-

Table 1 – Patient baseline characteristics.

Age, mean in years, SD	58.3, 13.4
Female, *n* (%)	40 (78%)
Race, *n* (%)	
Whites	32 (63%)
Blacks	17 (33%)
Asian	1 (2%)
No response	12 (4%)
Ease of transportation to Healthcare, n (%)	
Not hard at all	35 (68.6%)
Not very hard	12 (23.5%)
Somewhat hard	1 (2.0%)
Moderately hard	0 (0%)
Extremely hard	0 (0%)
Access to technology, n (%)	
Internet	49 (96.1%)
Cellular phone	44 (86.3%)
Smart phone	43 (84.3%)
Computer	49 (96.1%)
PROMIS Global Health, median T-score (IQR*)	
Physical health	43.0 (7.6)
Mental health	52.7 (12.9)

* IQR- interquartile range

terquartile range = 7.3, $P < 0.01$) and mental (52.7, interquartile range = 12.9, $P = 0.03$) health differed significantly from the reported population mean, which is 50 for both measures.[18]

The experiences and perspectives of patients and referring physicians aligned in many aspects (Table 2). Most patients and endocrinologists had used telemedicine before (75% and 52.9%, respectively, $P = 0.23$). Both groups reported a high willingness to try telemedicine in the future (92% and 100%, respectively, $P = 0.33$). A high proportion in both groups were either "somewhat" or "very" comfortable with new technology. Neither patients nor providers believed the medical assessment via telemedicine would be as good as an in-person visit (41.2% and 37.5%, respectively, $P = 0.18$). Almost all patients (98%) would like to meet the surgeon in person before surgery; a third of physicians reported it was "very important" and 60.0% reported it was "somewhat important" for the patients to do so. Almost all patients and all physicians reported faith in the confidentiality of telemedicine. Half of physicians thought telemedicine would not affect patient satisfaction with their medical care. Most patients (67.3%) reported telemedicine would have no effect on their satisfaction with their medical care. With regards to the influence of the COVID-19 pandemic on the decision to use telemedicine, all physicians reported that they were more likely to use telemedicine, compared to 70.6% of patients ($P = 0.03$).

Patients and physicians cited similar reasons either to try or not to try telemedicine (Figs. 1 and 2). Both groups cited convenience and available technology as reasons to try telemedicine. Both groups cited quality of care most often as a reason not to. Patients were more likely than physicians to report issues of personal connection as a reason to not try telemedicine (60.8% versus 25.0%, respectively, $P = 0.02$).

Regarding visit types (Figs. 3 and 4), nearly everyone in both groups expressed interest to use telemedicine for follow-up visits to review normal results and for pre-existing problems. Patients were significantly more interested in having postoperative visits done via telemedicine. To review abnormal results, physicians were more likely than patients to be willing to do so via telemedicine (81.3% versus 35.3%, respectively,

Table 2 – General survey results.

Question	Patient	Physician	*P*-value
Prior experience with telemedicine	38 (75%)	9 (56.3%)	0.23
Willing to try or use telemedicine again	47 (92%)	16 (100%)	0.33
Believe Telemedicine is as good as in-person visit	21(41.2%)	6 (37.5%)	1.00
Wants to meet surgeon in-person before surgery	50 (98.0%)		
Faith in confidentiality of telemedicine	48 (94.1%)	16 (100%)	0.57
Effect of telemedicine on satisfaction			0.19
Improved	8 (15.4%)	6 (37.5%)	
No change	35 (67.3%)	8 (50.0%)	
Worse	9 (17.3%)	2 (12.5%)	
Comfort level with new technology			0.54
Very comfortable	21 (41.2%)	8 (50.0%)	
Somewhat comfortable	28 (54.9%)	8 (50.0%)	
Somewhat uncomfortable	3 (5.9%)	0 (0.0%)	
Very uncomfortable	0 (0.0%)	0 (0.0%)	
Effect of COVID 19 on use of telemedicine			0.03
More likely	36 (70.6%)	16 (100%)	
Less likely	3 (5.9%)	0 (0.0%)	
Neither	13 (25.5%)	0 (0.0%)	

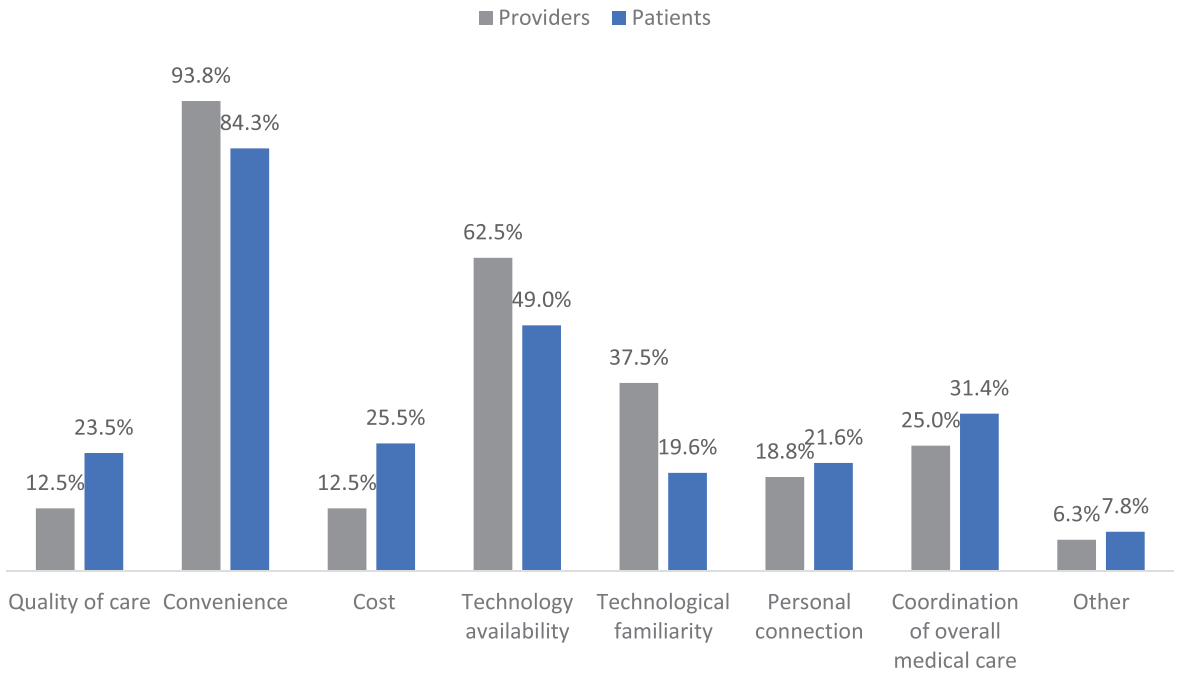

Fig. 1 – Comparison between patients' and providers' reasons to try telemedicine.*
*** All comparisons between providers and patients were non-significant, $P > 0.05$, Fisher's exact test.**

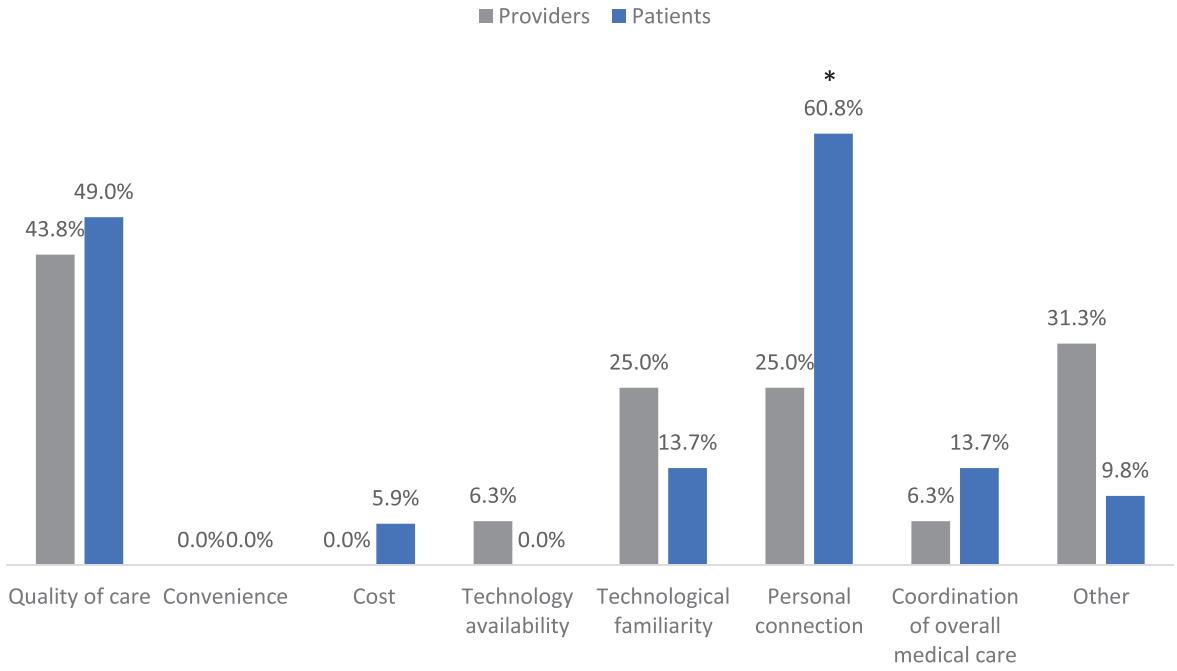

Fig. 2 – Comparison between patients' and providers' reasons NOT to try telemedicine.
*** P = 0.02.**

$P < 0.01$). Over half of patients were specifically not interested in reviewing abnormal results via telemedicine compared to 6.3% of physicians ($P < 0.01$).

We performed sub-analyses by race, age, and gender. Patients older than 60 years of age were less likely than patients younger than 60 to try telemedicine or to use it again (79.2% versus 100%, respectively, $P = 0.02$). Males were more likely than females to cite technological familiarity as a reason to try telemedicine (45.5% versus 12.5%, $P < 0.05$). We did not find other significant differences between the groups.

Discussion

This was a cross-sectional study surveying the attitudes of endocrine surgery patients and referring endocrinologists to-

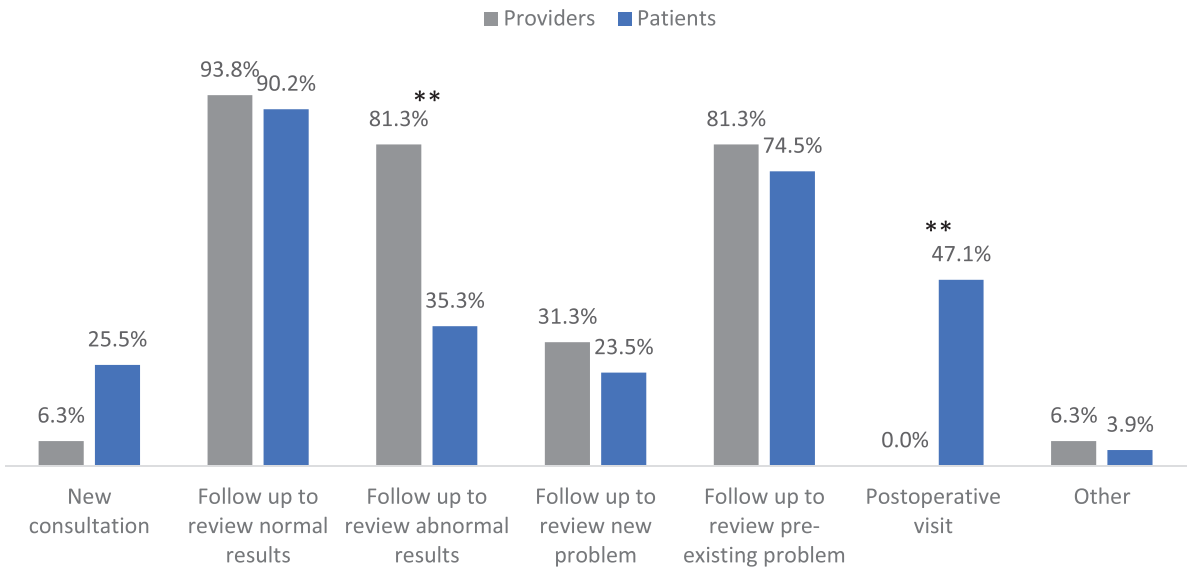

Fig. 3 – Comparing patients' and providers' interest in using telemedicine on various types of visits. ** $P < 0.01$.

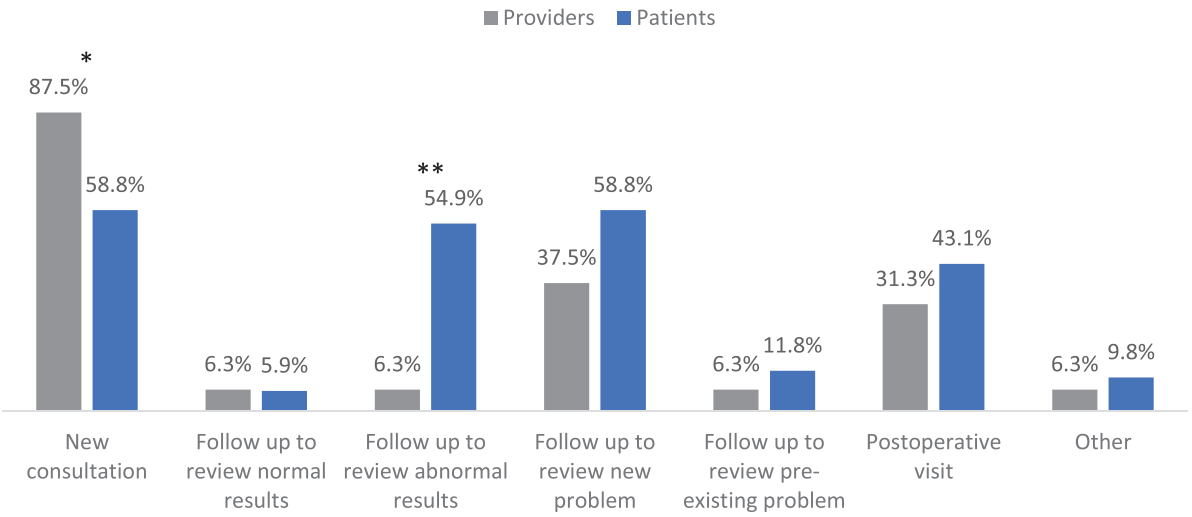

Fig. 4 – Comparing patients' and providers' choice on types of visits NOT to use telemedicine. * $P = 0.04$ ** $P < 0.01$.

wards the use of telemedicine at the start of the pandemic. This was the first study to directly compare the perspectives of endocrine surgery patients to that of their referring physicians. Both groups were receptive to using telemedicine, with convenience as the most commonly cited reason to use it. Both groups had reservations about the quality of care delivered by telemedicine. Patients and physicians agreed that follow-up visits to review normal results and pre-existing problems were suitable for telemedicine, but patients were more likely than physicians to prefer in-person visits to review abnormal results. The COVID-19 pandemic made both groups more inclined to use telemedicine.

Benefits to expanded use of telemedicine include time- and cost-savings,[2] and easier access to high-volume surgeons.[7,8,14] Telemedicine has been estimated to potentially save patients up to 360 miles of traveling distance and 5 hours of time in the post-operative period.[2,5] Despite the benefits, some downsides exist for providers and patients. Phone visits generate considerably less work relative value units compared to in-person visits, for example.[3] Insurance companies are not obligated by law to cover telemedicine at a comparable rate to in-person visits in all states, and reimbursement was frequently cited as a barrier to adopting telemedicine.[19] Significant technology access disparities exist across age, race, and socioeconomic status, which limits the wide-spread adoption of this modality.[20,21] In light of these potential barriers to telemedicine implementation either during or after the pandemic, it is helpful for surgeons to

understand the values and attitudes of our key stakeholders – both patients and referring physicians—to lend support to its continued use in policy decisions or guide the development of individual clinical practices. The results of our study helped to increase such understanding for endocrine surgeons.

Little data exists on the perception of telemedicine from patients and physicians. Prior to COVID-19, telemedicine studies focused on postoperative care, where they found high acceptability and satisfaction among patients.[2] Studies conducted during the COVID-19 pandemic on general surgery and otolaryngology patients have shown mixed results with regards to patient satisfaction. Sorensen and colleagues conducted an institutionally developed online survey during COVID-19, and found high satisfaction among respondents who were either patients who had undergone surgeries themselves or had people close to them that did ($n = 1827$, 86% of respondents reported being extremely or somewhat satisfied).[22] More than 70% of their patients reported it was extremely or very important to meet and be examined by the surgeon prior to surgery, which was similar to the findings in our study. Only 50-60% of their patients believed the physicians felt the same way; the referring endocrinologists in our study strongly favored that patients meet their surgeons prior to surgery. Fifty-five percent of the respondents reported in-person visits were more effective at establishing trust and comfort, which was similar to the findings in our study where 60.8% of patients cited concerns about personal connection as one of the reasons not to use telemedicine. Only a third of their patients would choose telemedicine if social distancing were removed from the equation.

In a study of otolaryngology patients, Likert-scaled surveys were sent to 100 patients who participated in a practice's rollout of telemedicine during the COVID-19 pandemic (1: strongly disagree to 7: strongly agree).[23] Respondents reported that telemedicine improved access to healthcare (mean 6.03) and reduced traveling time (mean 6.63). They tended to disagree that telemedicine provided for healthcare needs (mean 5.64) or that telemedicine visits were the same as in-person visits (mean 4.02). Similarly, almost half of our patients cited concerns about quality of care as a reason not to try telemedicine, and less than half of our patients felt telemedicine was as good as in-person visits. In another study using the Clinician and Group Consumer Assessment of Healthcare Providers and Systems (GCCAHPS) survey, satisfaction scores for virtual visits were consistently lower than in-person visits for questions regarding patient perceptions of physicians' knowledge of their history, physician attentiveness and the patients' likelihood to recommend the physician to others.[24]

Few studies examined both patient and physician attitudes toward telemedicine. A survey of patients (n=187) and physicians (n=26) from a breadth of surgical specialties in the mid-Atlantic region assessed each groups' attitudes about telemedicine, although the groups were not compared to each other.[25] Over three-fourths of physicians expressed interest to continue to use telemedicine after the COVID-19 pandemic, but only a third of patients felt the same way. In their study, 32.8% of patients reported they would still want to see their physicians in person despite the threat of COVID-19. In our study, 70.6% of our patients were more likely to use telemedicine because of the pandemic, 6% were less likely, and the other 25.5% said they were neither more nor less likely.

Our study has several limitations. The low response rates for both patients and physicians limits the generalizability of our findings. Despite this, our exploratory study echoed the results of previously published studies and our study subjects' racial makeup mirrored that of our patient demographics. Further follow up studies would benefit from a study that was incentivized, personalized or included reminders.[26–29] Another limitation is whether respondents were fully representative: our respondents had ubiquitous access to and a high comfort level with technology, which contrasts national and local data: only 84% of American adults reported using the internet nationally and approximately 25% of the households in Washington, DC do not have broadband internet access.[20,22,30] This represents a selection bias and true use and acceptance of telemedicine may be lower than reported. The study elicited overall perspectives on telemedicine, without distinguishing the specific modality, i.e. audiovisual versus audio only. We chose to not distinguish one from the other given the focused scope of this exploratory study. Given the increased adoption of telemedicine, future studies that parse out perceptions of the specific approach would add greater nuance to our findings. Now that the pandemic has affected daily lives in the United States for more than a year, it would be helpful to repeat and expand the study to see if patient and physician perspectives have changed since the start of the pandemic, which we intend to do. Future studies with a larger sample size—achieved by the addition of techniques to increase survey response rate, longitudinal data and information about the utilization patterns of telemedicine may help address these limitations and yield new information on this subject.

Conclusion

Telemedicine is a mutually acceptable method for endocrine surgery patients and their referring physicians, although in-person visits continue to have their place. Understanding the perspectives of key stakeholders in an endocrine surgery clinical practice provides useful information for endocrine surgeons tailoring their practice during and after the pandemic, and also provides guidance about its more general place in medical and surgical care. COVID-19 overwhelmingly made patients and physicians more likely to use telemedicine. The pandemic will eventually end, but telemedicine use may continue to expand post-pandemic as an important point of access and means of care delivery for endocrine surgeons and their patients.

Author Contributions

Hui Zheng was involved in data collection, data analysis and manuscript preparation. Jennifer Rosen was involved in study conception, implementation, and manuscript revision. Nicholas Bader was involved in study implementation. Victoria Lai was involved in all aspects of the study.

Disclosure

The authors report no proprietary or commercial interest in any product mentioned or concept discussed in this article.

Declaration of Competing Interest

None.

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