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Research

Outpatient visit modality and parallel patient satisfaction: A multi-site cohort analysis of telemedicine and in-person visits during the COVID-19 pandemic

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Abstract
Telemedicine approaches provide many benefits to patients across both primary and specialty care. Patient acceptance is imperative to successful telemedicine implementation. As telemedicine utilization continues to surge, it is imperative that healthcare organizations have a method for evaluating the patient experience with these types of visits. Previous studies on experience with telemedicine have focused on smaller patient populations with narrow inclusion criteria and limited geographical reach. This research described how patients' satisfaction with video telemedicine-based visits varied based on patient characteristics and how they compare with in-person visits. We obtained and analyzed results from standardized patient experience surveys to compare telemedicine and in-person clinic visits during the COVID-19 pandemic (between July 1, 2020, and June 30, 2021) across a diverse patient population. During the study timeframe, surveys were sent to 1,521,398 patients with a response rate of 20% (307,185). Our organization's unique structure, size, and geographic spread allowed for a deeper and more comprehensive examination of telemedicine participants. Though a few trends emerged in the results, there were no significant differences in patient ratings of telemedicine visits and in-person clinic visits during the same period (p=0.672). This study demonstrated that patient satisfaction with telemedicine visits was non-inferior to in-person outpatient visits during the study timeframe.

Keywords
Telemedicine, experience, patient, ambulatory care, satisfaction, patient satisfaction

Introduction

Patient satisfaction is utilized in healthcare as a measure of clinical quality, with ties to reimbursement from the Centers for Medicare and Medicaid.[1] The use of telemedicine visits is rapidly increasing, but mixed results have been reported regarding satisfaction.[2-9] Telemedicine uses video imaging and telecommunication technologies to exchange electronic information and facilitate clinical care, patient education, and health administration at a distance.[10] These telemedicine approaches can benefit patients by improving access to primary and specialty care that may not otherwise be available locally,[9] with the potential added benefit of reducing travel-related expenses associated with the pursuit of care.[7,11] During the COVID-19 pandemic, telemedicine utilization increased dramatically due to decreased in-person visits to reduce the potential for viral transmission and preserve personal protective equipment.[12-13] Patient satisfaction has been cited as the most integral element in the success of telemedicine implementations[14]; if not achieved, adoption of the telemedicine technology and services will fail[7,13,15] or, at best, become redundant and expensive.[1] The use of telemedicine visits as an alternative to in-person outpatient visits will continue to expand only if we achieve parity in patient satisfaction between these two modalities.[7] There is a gap in the literature regarding telemedicine satisfaction involving patients across large geographic regions and varying practice categories. Much of the previous research on satisfaction with telemedicine was performed by individual organizations that fit into a single practice category, such as rural practice, academic medical center, or destination medical center.[13-14,16] The purpose of this research was to describe how patients' satisfaction with video telemedicine-based visits varied based on patient characteristics and how they compare with in-person visits.

Methods

Setting

Our organization is a large integrated multispecialty academic nonprofit health care system committed to clinical practice, research, and education. Facilities are located across three main campuses in the Midwest (Rochester, Minnesota), Southwest (Scottsdale and

Phoenix, Arizona), and Southeast (Jacksonville, Florida) and throughout an integrated health system of over 60 community-based hospital and clinic campuses residing in 44 communities across Southern Minnesota, Northern Iowa, and Western Wisconsin.[17-18] Most of the practices reside in rural communities with largely agriculturally focused economies. More than 1.4 million patients received care in 2021, with patients residing in all 50 U.S. states and 139 countries.[19]

Telemedicine services at our organization include asynchronous services (patient portal, eConsults, and digital express care), synchronous video telemedicine, remote patient monitoring (RPM), and mobile applications.[20-21] This study focuses on synchronous video telemedicine to home services. These visits were scheduled as regular appointments and delivered via the synchronous videoconferencing software (Zoom™, San Jose, CA) that was integrated into the electronic health record (EHR) (EPIC™, Verona, WI). Prior to the COVID-19 pandemic, video visits were focused on routine follow-up appointments by select surgical and specialty practices, comprising fewer than 1% of overall outpatient visit volumes.[21] Providers could directly access the videoconference software through the EHR scheduling function. Patients accessed the videoconference through our organization's dedicated patient application on their mobile device, or via the patient portal through a computer web browser. Patients were guided through an electronic check-in process and virtually "roomed" with the aid of administrative staff.[22] If insurmountable technical issues were encountered by either the patient or provider, providers converted the visit to a telephone consultation.[15,22] These visits will be referenced solely as "telemedicine" for the remainder of this publication.

Participants

Patients included in this study were seen by one or more employed providers in an outpatient setting during the COVID-19 pandemic (between July 1, 2020 and June 30, 2021) and completed a patient experience survey. The study includes males and females of all ages who were seen at an in-person visit or via telemedicine in any clinical department or specialty for new or pre-existing concern(s). Surveys were administered as part of our standard patient experience surveying process, which is conducted with the assistance of Press Ganey®, a contracted healthcare experience firm, using a version of their standard, validated survey instruments. Telemedicine surveys were administered electronically and solicited via an email invitation within one week of the telemedicine visit. Surveys for in-person visits were either mailed to patients' homes or solicited via the same email invitation process based on volume-based algorithms.

Materials & Procedure

Patient experience data were routinely captured for all modalities of clinical care to measure the perceptions of care provided to patients.[7] We utilized a standard version of the Press Ganey® outpatient medical practice survey. Questions were focused on patient perceptions of access, moving through the visit, nurse/assistant, care provider, personnel issues, and their overall assessment and requests. Responses were measured using a Likert scale ranging from very poor (1) to very good (5), and additional space was provided for free-text comments. The survey has been found to have high internal reliability for all scales, with values between $\alpha = 0.79$ and 0.96 [23]. The survey is offered in English, Spanish, and Arabic; if the patient's preferred language is not one of these, the survey is provided in English.

For the sake of this analysis, the top box score for patients' overall likelihood to recommend was used as the primary measure of overall satisfaction with the service as our organization utilizes this top box score as our main indicator of patient satisfaction for other clinical services. The top box score is the percentage of responses answered with the highest response of "very good" or "very likely" on the five-level Likert-type scale[24] and is thought to best reflect patients' trust and loyalty.[3] Top-box scores were further analyzed based on the relative date of the visit as well as based on patient demographic factors (age group, sex, race, ethnicity, and patient's primary language). Differences between observed top box scores for telemedicine versus in-person clinical visits were assessed using a z-test. Data analysis was conducted via SPSS (version 27.0, Armonk, NY) and BlueSky Statistics (version 7.20, Chicago, IL). A p-value < 0.05 was considered statistically significant. This study was reviewed by our organization's Institutional Review Board and deemed to meet the classification of exempt human subjects' research.

Results

In total, 1,521,398 surveys were sent to patients (or a caregiver, if delegated for patients 0-17 years of age) with 307,185 responses received. Response rates within the survey period were 23.3% for surveys of in-person visits and 19.4% for surveys of telemedicine visits. Of the total responses received, 44,888 were seen via a telemedicine visit (14.6%), while the remaining 262,297 patients were seen for an in-person visit (85.4%).

Responses were for patients who were primarily female (55.8%) and ranged in age from birth to 105 years old (average age of 63 years old). The highest rate of telemedicine survey completions was during quarter four of 2020 and quarter one of 2021 (26.8% and 30.6% respectively). Comparatively, the highest rate of in-person surveys completed was during quarters one and two of

2021 (27.4% and 28.9% respectively) (Appendix, Table 1). Patients originated from four different categories of location: local (patients who were within the same city as the site of service, which represented 63.2%), regional (patients who resided outside the city of the site of service but within one of the eight U.S. regions where a medical center exists, which represented 17.3%), national (patients who were outside the city and region of the site of service but within the United States, which represented 19.1%), and international (patients residing outside of the United States, which represented 0.4%). Patients were seen in a variety of practice areas during the study timeframe, including five primary care specialties (23.8%), 18 medical specialties (46.9%), seven surgical specialties (28.2%), and three pediatric specialties (1.0%).

No significant differences were observed for overall top box scores between telehealth and in-person visit satisfaction (p=0.672). The null difference held true for patient age groups, sex, race, ethnicity, and language (p>0.05). Patient/caregiver responses for patients younger than 17 years of age revealed greater satisfaction for in-person visits (p=0.056), while patients older than 80 years of age expressed greater satisfaction for telemedicine visits (p=0.071). Men who were surveyed demonstrated a trend toward higher satisfaction for in-person visits (p=0.051). Asian/Pacific Islanders surveyed revealed a tendency to higher satisfaction for telemedicine (p=0.057). None of these trends achieved statistical significance. (Appendix, Table 2)

Patients' experiences did differ between modalities relative to patient location as well as among select provider types and medical specialties (Appendix, Table 3). Regional, national, and international patients expressed a significantly higher satisfaction with in-person visits versus those conducted via telemedicine (88.5 vs 91.5, p=0.000; 91.0 vs. 92.9, p=0.000; and 83.0 vs 87.6, p=0.030 respectively). However, satisfaction remained high for both modalities for all locations. Patient satisfaction was significantly higher for in-person visits delivered by nurse practitioners (85.6 vs. 87.1, p=0.000) though there were no differences between modalities for visits conducted by physicians, physician assistants, or residents (88.7 vs 88.6, p=0.646; 88.8 vs. 88.6, p=0.795; and 86.9 vs 86.0, p=0.237 respectively).

Overall, patients reported significantly higher satisfaction with in-person visits for medical specialties (88.6 vs. 89.3, p=0.000), driven by differences in satisfaction for visits conducted within Executive Health (91.2 vs. 95.8, p=0.000) and General Internal Medicine (85.5 vs. 92.7, p=0.000). Conversely, patients reported significantly higher satisfaction with telemedicine visits for surgical specialties (89.8 vs. 88.8, p=0.006), driven largely by significant differences in satisfaction among orthopedic surgery (89.6 vs. 87.4, p=0.034) and general surgery (92.3 vs. 87.7, p=0.007). Patients also reported significantly higher satisfaction with in-person visits for primary care services within OB/GYN (76.8 vs. 84.3, p=0.001) and Community Pediatric & Adolescent Medicine (73.4 vs. 83.0, p=0.000), though there were no significant differences in satisfaction for primary care overall (84.3 vs. 85.1, p=0.064).

Discussion

Patient satisfaction scores have been used by healthcare organizations around the world not only to evaluate and expand clinical care, but also to help plan the development and advancement of services such as telemedicine.[25] Previous telemedicine research showed that patients' low perceptions of telemedicine visits posed a large barrier to successful expansion of these services.[13] Some of the previous, low patient perceptions of telemedicine stemmed from barriers such as lack of familiarity with the technology, cost, resistance to change, and perceived quality of care via a virtual format.[13]

This manuscript represents insights from one of the largest collections of survey results to the authors' knowledge, reflecting a substantially larger patient cohort in this analysis than prior reports and allowing for detailed analysis by various subgroups. Additionally, the Press Ganey® survey tool that was utilized for patients is a standardized and validated instrument.[23] There were no significant overall differences among the standard indices of patient satisfaction with telemedicine versus in-person outpatient visits. Some trends were observed within certain age groups, genders, and races, which may represent opportunities for future exploration and study.

As noted, patients expressed a difference in satisfaction between care delivery modalities relative to location, select medical and surgical specialties, and visits performed by nurse practitioners. The observed differences may reflect the level of patient expectations relative to specific domains of care. Patients seen within the Executive Health department tend to be high-profile national and international patients who expect a more intensive, hands-on, approach to their visits. Observed results may also relate to the complexity and seriousness of the visit. Regional, national, and international patients typically travel to our facilities for more complex and serious conditions which require intensive testing and physical assessments, whereas local patients are more likely to receive standard, or routine, primary care. Historically, we have seen higher satisfaction scores for patients with more complex and serious medical conditions. Differences in satisfaction between modalities for Nurse Practitioner may be driven by the types of practices that utilize this role, with a lower instance among medical and surgical specialties which otherwise traditionally have higher satisfaction rates. Although these differences were overall

significant, it is important to note that satisfaction was high across both modalities under each of these circumstances.

During the COVID-19 pandemic, a time when the U.S. state governments were issuing stay-at-home orders, healthcare organizations such as ours were compelled to work quickly and efficiently to shift from providing care in-person to providing care via virtual means through telemedicine. Our patients were very receptive to the transition to virtual visits as a primary method of maintaining their physical wellbeing while receiving proper healthcare. During this unprecedented timeframe, patients may have been exclusively restricted to telemedicine visits for their care. The temporary, low availability of in-person visits may have skewed or biased patients' satisfaction with the telemedicine services, as they may have been happy to receive care in whatever way they could. This was especially true for surgical patients as all elective surgeries were cancelled during most of the pandemic. It could also be linked to the ease of attending short, post-op, visits via telemedicine, thereby saving time and money for the patient.[11]

Patients may have also expressed high satisfaction with telemedicine visits as this mode of evaluation kept them safe from possible viral transmission and preserved personal protective equipment. These conjectures were seemingly borne out in other studies that compared patient satisfaction with telemedicine both pre- and post-COVID-19, finding that Press Ganey® patient satisfaction scores were significantly higher during COVID-19 (93.4% v. 92.5%, P<.001).[14] An additional limiting factor is non-responder bias, as previous studies have shown that satisfied patients are more likely to complete surveys, such as the one utilized in this study.[25]

It is important that healthcare organizations do not exclusively target telemedicine to their younger, more tech-savvy, patients. As the study showed, the highest level of patient satisfaction within telemedicine visits was among those patients within the 65-79-year age range. To implement a successful telemedicine program, healthcare organizations should also ensure scheduling telemedicine appointments is at least as easy as scheduling for an in-person visit.[21,26]

Conclusion

Compared to previous studies where patients had low perceptions of telemedicine visits which posed a large barrier to successful expansion on these services, this study demonstrated that patient satisfaction with telemedicine visits was non-inferior to in-person outpatient visits during the study timeframe. This study represents findings from over 300,000 patients– a substantially-larger patient cohort than prior reports. Patients across a wide geographic area, and a diverse range of clinical specialty visits, were found to have equal levels of satisfaction with telemedicine visits when compared to in-person visits during the COVID-19 pandemic. As telemedicine visits become more common it will be imperative that healthcare organizations create successful telemedicine processes for patients and staff with an aim of high satisfaction. Trends observed within certain age groups, genders, and races may represent opportunities for future exploration and study.

References

1. Kruse CS, Krowski N, Rodriguez B, Tran L, Vela J, Brooks M. Telehealth and patient satisfaction: A systematic review and narrative analysis. *BMJ Open*. 2017;7(8):e016242. doi:10.1136/bmjopen-2017-016242
2. Coffey JD, Christopherson LA, Glasgow, AE, et al. Implementation of a multisite, interdisciplinary remote patient monitoring program for ambulatory management of patients with COVID-19. *npj Digit. Med.* 2021;4(123). doi:10.1038/s41746-021-00490-9
3. Wosik J, Fudim M, Cameron B, et al. Telehealth transformation: COVID-19 and the rise of virtual care. *J Am Med Inform Assoc*. 2020; 27(6):957–962. doi:10.1093/jamia/ocaa067
4. Contreras CM, Metzger GA, Beane, JD, et al. Telemedicine: Patient-provider clinical engagement during the COVID-19 pandemic and beyond. *J Gastrointest Surg*. 2020;24:1692–1697. doi:10.1007/s11605-020-04623-5
5. Mehrotra A, Chernew D, Linetsky H, Hatch D. The impact of the COVID-19 pandemic on outpatient visits: A rebound emerges, to the point (blog). *Commonwealth Fund*. May 19, 2020.
6. Robbins T, Hudson S, Ray P, et al. COVID-19: A new digital dawn? *Digit Health*. 2020;6. doi:10.1177/2055207620920083
7. Nguyen M, Waller M, Pandya A, Portnoy J. A review of patient and provider satisfaction with telemedicine. *Curr Allergy Asthma Rep*. 2020;20(11):72. doi:10.1007/s11882-020-00969-7
8. Sinsky CA, Jerzak JT, Hopkins KD. Telemedicine and team-based care: The perils and the promise. *Mayo Clin Proc*. 2021; 96(2):429-437. doi:10.1016/j.mayocp.2020.11.020
9. Qureshi AA, Brandling-Bennett HA, Wittenberg E, et al. Willingness-to-pay stated preferences for telemedicine versus in-person visits in patients with a history of psoriasis or melanoma. *Telemed J E Health*. 2006;12(6):639–643. doi:10.1089/tmj.2006.12.639
10. The Office of the National Coordinator for Health Information Technology. Telemedicine and Telehealth. HealthIT.gov. https://www.healthit.gov/topic/health-it-

initiatives/telemedicine-and-telehealth. Published September 24, 2020. Accessed December 1st, 2021.
11. Demaerschalk B, Cassivi S, Blegen R, et al. Health economic analysis of postoperative video telemedicine visits to patients' homes. *Telemed J E Health*. 2021;27(6):635-640. doi:10.1089/tmj.2020.0257
12. Demaerschalk B, Blegen R, Ommen, S. Scalability of telemedicine services in a large integrated multispecialty health care system during COVID-19. *Telemed J E Health*. 2021;27(1). doi:10.1089/tmj.2020.0290
13. Gentry M, Puspitasari A, McKean A, et al. Clinician satisfaction with rapid adoption and implementation of telehealth services during the COVID-19 pandemic. *Telemed J E Health*. 2021; 27(12):1385-1392. doi:10.1089/tmj.2020.0575
14. Ramaswamy A, Yu M, Drangsholt S, et al. Patient satisfaction with telemedicine during the COVID-19 pandemic: Retrospective cohort study. *J Med Internet Res*. 2020;22(9): e20786-e20786. doi:10.2196/20786
15. Ebbert JO, Ramar P, Tulledge-Scheitel SM, et al. Patient preferences for telehealth services in a large multispecialty practice. *J Telemed Telecare*. 2021. doi:10.1177/1357633X20980302
16. Mair F, Whitten P. Systematic review of studies of patient satisfaction with telemedicine. *BMJ*. 2000; 320(7248):1517-1520. doi:10.1136/bmj.320.7248.1517
17. Berry L, Seltman KD. The enduring culture of Mayo clinic. *Mayo Clin Proc*. 2014;89(2):144-147. doi:10.1016/j.mayocp.2013.10.025
18. Berry L, Seltman KD. *Management lessons from Mayo Clinic: Inside one of the world's most admired service organizations*. New York: McGraw-Hill; 2008.
19. Mayo Clinic 2021 Fact Sheet. Mayo Clinic. Updated February 28, 2022. Accessed July 22, 2022. https://cdn.prod-carehubs.net/n7-mcnn/7bcc9724adf7b803/uploads/2022/02/Fact-Sheet-Financials.pdf
20. Kreofsky B, Blegen R, Lokken T, Kapraun S, Buchman M, Demaerschalk B. Sustainable Telemedicine: Designing and building infrastructure to support a comprehensive telemedicine practice. *Telemed J E Health*. 2018;24(12):1021-1025. doi:10.1089/tmj.2017.0291
21. Haddad T, Blegen R, Prigge J, et al. A scalable framework for telehealth: The Mayo Clinic Center for Connected Care response to the COVID-19 pandemic. *Telemed Rep*. 2021;2(1):78-87. doi:10.1089/tmr.2020.0032
22. Ramjewan A, Stelpflug A, Elsen S, Bhandari P, Coffey J. Staffing models for integration of virtual visits into clinical operations. *Management in Healthcare*. 2021;13:121-133.
23. Presson AP, Zhang C, Abtahi AM, Kean J, Hung M, Tyser AR. Psychometric properties of the Press Ganey® outpatient medical practice survey. *Health Qual Life Outcomes*. 2017;15(1): 32. doi:10.1186/s12955-017-0610-3
24. Lee MO, Altamirano J, Garcia LC, et al. Patient age, race and emergency department treatment area associated with "topbox" Press Ganey scores. *West J Emerg Med*. 2020;21(6):117-124. doi: 10.5811/westjem.2020.8.47277
25. Becevic M, Boren S, Mutrux R, Shah Z, Banerjee S. User satisfaction with telehealth: Study of patients, providers, and coordinators. *Health Care Manag*. 2015;34(4):337-349. doi:10.1097/HCM.0000000000000081
26. Wood BR, Young JD, Abdel-Massih RC, et al. Advancing digital health equity: A policy paper of the infectious diseases society of America and the HIV medicine association. *Clin Infect Dis*. 2021;72(6):913–919. doi:10.1093/cid/ciaa1525

Appendix

Table 1. Survey response rates based on patient demographics and clinic factors – comparing overall clinical visits as well as by modality (telemedicine versus in person) between July 1, 2020, and June 30, 2021

	Overall		Telemedicine		In Person	
	n	% Total	n	% Total	n	% Total
Total Response	307,185	100%	44,888	14.6%	262,297	85.4%
Responses by Quarter						
2020, Quarter 3 (7/1/20-9/30/20)	63,179	20.6%	7,618	17.0%	55,561	21.2%
2020, Quarter 4 (10/1/20-12/31/20)	71,209	23.2%	12,015	26.8%	59,194	22.6%
2021, Quarter 1 (1/1/21-3/31/21)	85,495	27.8%	13,736	30.6%	71,759	27.4%
2021, Quarter 2 (4/1/21-6/30/21)	87,302	28.4%	11,519	25.7%	75,783	28.9%
Responses by Age Group						
0-17 yrs.	9,782	3.2%	1,310	2.9%	8,472	3.2%
18-34 yrs.	14,537	4.7%	2,786	6.2%	11,751	4.5%
35-49 yrs.	27,180	8.8%	5,418	12.1%	21,762	8.3%
50-64 yrs.	80,553	26.1%	13,665	30.4%	66,888	25.5%
65-79 yrs.	139,995	45.6%	18,682	41.6%	121,313	46.3%
80+ yrs.	35,138	11.6%	3,027	6.7%	32,111	12.2%
Responses by Sex						
Female	170,657	55.6%	25,059	55.8%	145,598	55.5%
Male	136,506	44.4%	19,827	44.2%	116,679	44.5%
Responses by Race						
White	289,273	95.1%	41,438	93.5%	247,835	95.4%
Black or African American	5,056	1.7%	948	2.1%	4,108	1.6%
Asian/Pacific Islander	4,918	1.6%	931	2.1%	3,987	1.5%
American Indian or Alaska Native	885	0.3%	198	0.4%	687	0.3%
African	244	0.1%	43	0.1%	201	0.1%
Other	3,828	1.3%	744	1.7%	3,084	1.2%
Responses by Ethnicity						
Hispanic or Latino	8,258	2.7%	1,813	4.2%	6,445	2.5%
Not Hispanic or Latino	292,834	97.3%	41,785	95.8%	251,049	97.5%
Responses by Language						
English	305,060	99.3%	44,473	99.1%	260,587	99.4%
Spanish	944	0.3%	235	0.5%	709	0.3%
Arabic	185	0.1%	34	0.1%	151	0.1%
Chinese	105	0.0%	28	0.1%	77	0.0%
Other	854	0.3%	109	0.2%	745	0.3%
Responses by Patient Location						
Local	194,159	63.3%	19,509	43.5%	174,650	66.6%
Regional	53,084	17.3%	9,055	20.2%	44,029	16.8%
National	58,712	19.1%	15,705	35.0%	43,007	16.4%
International	1,174	0.4%	619	1.4%	555	0.2%
Responses by Provider Type						
Physician	200,673	66.6%	31,113	69.9%	169,560	66.0%
Nurse Practitioner	49,168	16.3%	7,505	16.9%	41,663	16.2%
Physician Assistant	28,706	9.5%	3,444	7.7%	25,262	9.8%
Resident	22,878	7.6%	2,423	5.4%	20,455	8.0%

Appendix (cont'd.)

Table 1 (cont'd.). Survey response rates based on patient demographics and clinic factors – comparing overall clinical visits as well as by modality (telemedicine versus in person) between July 1, 2020, and June 30, 2021

	Overall		Telemedicine		In Person	
	n	% Total	n	% Total	n	% Total
Responses by Primary Care	73,246	23.8%	8,300	18.5%	64,946	24.8%
Family Medicine	43,073	14.0%	5,139	11.4%	37,934	14.5%
Community Internal Medicine	19,635	6.4%	2,238	5.0%	17,397	6.6%
OB/GYN	3,859	1.2%	332	0.7%	3,527	1.3%
Family Med Residency Program	3,091	1.0%	288	0.6%	2,803	1.1%
Community Ped & Adolescent Med	2,547	0.8%	248	0.6%	2,299	0.9%
Responses by Medical Specialties	144,150	46.9%	26,676	59.4%	117,474	44.8%
Hematology & Oncology	25,950	8.4%	4,112	9.2%	21,838	8.3%
Gastroenterology & Hepatology	10,440	3.4%	3,048	6.8%	7,392	2.8%
Cardiovascular Disease	18,054	5.9%	2,999	6.7%	15,055	5.7%
Neurology	13,661	4.4%	2,882	6.4%	10,779	4.1%
Sleep Medicine	4,366	1.4%	1,585	3.5%	2,781	1.1%
Endocrinology	7,654	2.5%	1,533	3.4%	6,121	2.3%
Psychiatry & Psychology	3,680	1.2%	1,367	3.0%	2,313	0.9%
Rheumatology	5,374	1.7%	1,007	2.2%	4,367	1.7%
Pulmonary Medicine	5,363	1.7%	931	2.1%	4,432	1.7%
Executive Health	3,082	1.0%	870	1.9%	2,212	0.8%
General Internal Medicine	2,923	1.0%	840	1.9%	2,083	0.8%
Nephrology	4,100	1.3%	618	1.4%	3,482	1.3%
Radiation Oncology	4,499	1.5%	609	1.4%	3,890	1.5%
Infectious Diseases	2,127	0.7%	549	1.2%	1,578	0.6%
Dermatology	12,166	4.0%	498	1.1%	11,668	4.4%
Pain Medicine	2,778	0.9%	450	1.0%	2,328	0.9%
Women's Health	1,956	0.6%	430	1.0%	1,526	0.6%
Physical Medicine & Rehabilitation	3,651	1.2%	403	0.9%	3,248	1.2%
Responses by Surgical Specialties	86,728	28.2%	9,292	20.7%	77,436	29.5%
Urology	11,505	3.7%	2,105	4.7%	9,400	3.6%
Neurological Surgery	5,987	2.0%	1,567	3.5%	4,420	1.7%
Orthopedic Surgery	20,455	6.7%	1,095	2.4%	19,360	7.4%
OB/GYN-Gynecology	4,315	1.4%	511	1.1%	3,804	1.5%
Transplant-Kidney/Pancreas	2,176	0.7%	493	1.1%	1,683	0.6%
Otorhinolaryngology	7,868	2.6%	449	1.0%	7,419	2.8%
General Surgery	3,579	1.2%	415	0.9%	3,164	1.2%
Responses by Pediatric Specialties	3,061	1.0%	620	1.4%	2,441	0.9%
Pediatric Neurology	484	0.2%	132	0.3%	352	0.1%
Pediatric Gastroenterology	313	0.1%	100	0.2%	213	0.1%
Pediatric Cardiology	411	0.1%	52	0.1%	359	0.1%

Appendix (cont'd.)

Table 2. Patient satisfaction based on patient demographic factors – comparing clinical visits by modality (telemedicine versus in person) between July 1, 2020, and June 30, 2021

	Telemedicine		In Person		
	Top Box Score	n	Top Box Score	n	p-value
Overall Likelihood to Recommend	88.0	44,888	88.1	262,297	0.672
Likelihood to Recommend by Quarter					
2020, Quarter 3 (7/1/20-9/30/20)	88.1	7,618	87.6	55,561	0.150
2020, Quarter 4 (10/1/20-12/31/20)	87.6	12,015	87.9	59,194	0.343
2021, Quarter 1 (1/1/21-3/31/21)	88.3	13,736	88.3	71,759	1.000
2021, Quarter 2 (4/1/21-6/30/21)	88.1	11,519	88.5	75,783	0.248
Likelihood to Recommend by Age Group					
0-17 yrs.	81.3	1,310	83.4	8,472	0.056
18-34 yrs.	80.7	2,786	82.0	11,751	0.131
35-49 yrs.	84.7	5,418	84.2	21,762	0.303
50-64 yrs.	88.3	13,665	88.0	66,888	0.393
65-79 yrs.	90.3	18,682	90.0	121,313	0.188
80+ yrs.	88.4	3,027	87.3	32,111	0.071
Likelihood to Recommend by Sex					
Female	87.6	25,059	87.3	145,598	0.252
Male	88.6	19,827	89.1	116,679	0.051
Likelihood to Recommend by Race					
White	88.2	41,438	88.3	247,835	0.483
Black or African American	88.2	948	86.9	4,108	0.296
Asian/Pacific Islander	86.1	931	83.6	3,987	0.057
American Indian or Alaska Native	85.9	198	86.3	687	0.869
African	81.4	43	80.1	201	0.847
Other	87.1	744	85.0	3,084	0.144
Likelihood to Recommend by Ethnicity					
Hispanic or Latino	88.3	1,813	88.2	6,445	0.889
Not Hispanic or Latino	88.1	41,785	88.1	251,049	0.726
Likelihood to Recommend by Language					
English	88.1	44,473	88.1	260,587	0.630
Spanish	86.4	235	85.9	709	0.854

Appendix (cont'd.)

Table 3. Patient satisfaction based on clinic factors – comparing clinical visits by modality (telemedicine versus in person) between July 1, 2020, and June 30, 2021

	Telemedicine		In Person		
	Top Box Score	n	Top Box Score	n	p-value
Responses by Patient Location					
Local	85.6	19,509	86.1	174,650	0.056
Regional	88.5	9,055	91.5	44,029	0.000*
National	91.0	15,705	92.9	43,007	0.000*
International	83.0	619	87.6	555	0.030*
Responses by Provider Type					
Physician	88.7	31,113	88.6	169,560	0.646
Nurse Practitioner	85.6	7,505	87.1	41,663	0.000*
Physician Assistant	88.8	3,444	88.6	25,262	0.795
Resident	86.9	2,423	86.0	20,455	0.237
Responses by Primary Care	84.3	8,300	85.1	64,946	0.064
Family Medicine	84.7	5,139	84.7	37,934	0.926
Community Internal Medicine	85.6	2,238	86.3	17,397	0.394
OB/GYN	76.8	332	84.3	3,527	0.001*
Family Med Residency Program	83.0	288	82.0	2,803	0.671
Community Ped & Adolescent Med	73.4	248	83.0	2,299	0.000*
Responses by Medical Specialties	88.6	26,676	89.3	117,474	0.000*
Hematology & Oncology	91.4	4,112	92.0	21,838	0.160
Gastroenterology & Hepatology	87.5	3,048	88.4	7,392	0.192
Cardiovascular Disease	89.6	2,999	89.8	15,055	0.692
Neurology	88.1	2,882	87.1	10,779	0.153
Sleep Medicine	89.1	1,585	87.2	2,781	0.061
Endocrinology	86.7	1,533	88.4	6,121	0.062
Psychiatry & Psychology	83.3	1,367	83.0	2,313	0.784
Rheumatology	89.4	1,007	87.3	4,367	0.071
Pulmonary Medicine	88.2	931	88.4	4,432	0.876
Executive Health	91.2	870	95.8	2,212	0.000*
General Internal Medicine	85.5	840	92.7	2,083	0.000*
Nephrology	89.0	618	89.3	3,482	0.830
Radiation Oncology	91.8	609	93.1	3,890	0.238
Infectious Diseases	87.8	549	88.0	1,578	0.892
Dermatology	88.4	498	89.1	11,668	0.620
Pain Medicine	84.0	450	84.3	2,328	0.881
Women's Health	91.4	430	92.4	1,526	0.495
Physical Medicine & Rehabilitation	89.3	403	87.1	3,248	0.211
Responses by Surgical Specialties	89.8	9,292	88.8	77,436	0.006*
Urology	90.4	2,105	90.1	9,400	0.686
Neurological Surgery	88.3	1,567	88.8	4,420	0.622
Orthopedic Surgery	89.6	1,095	87.4	19,360	0.034*
OB/GYN-Gynecology	90.8	511	90.9	3,804	0.971
Transplant-Kidney/Pancreas	88.2	493	91.0	1,683	0.072
Otorhinolaryngology	90.4	449	89.7	7,419	0.607
General Surgery	92.3	415	87.7	3,164	0.007*
Responses by Pediatric Specialties	88.7	620	86.2	2,441	0.106
Pediatric Neurology	87.9	132	86.9	352	0.781
Pediatric Gastroenterology	89.0	100	83.6	213	0.209
Pediatric Cardiology	94.2	52	90.0	359	0.332