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Telehealth Utilization in Oral Medicine and Oral and Maxillofacial Surgery

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Abstract

Objectives: *The objectives of this retrospective study were to analyze telehealth utilization for two specialty care practices: oral medicine (OM) and oral and maxillofacial surgery (OMFS) during the first 2 years of the pandemic, its impact as a new treatment modality and on participating providers, as well as identify the type of patient visit that most readily adopted telehealth.*

Methods: *Retrospective study of patients who sought specialty services, OM and OMFS, at an outpatient clinic in a university health system setting between March 1, 2019, and February 28, 2022. Source data were obtained from Epic, an electronic medical record application. Data were graphed using Tableau and Microsoft Excel software. Statistical analysis was performed utilizing chi-squared test and analysis of variance (ANOVA).*

Results: *OMFS utilized telehealth 12% of the time, and OM 8% of the time. The majority (87%) of telehealth visits were for return patients (RPs). Compared with the first year of the pandemic, there was a decrease in the number of telehealth visits in the second year ($p = 0.0001$). As of August 2022, new patient (NP) telehealth encounters have largely returned to prepandemic levels (0–1.5%), whereas RP telehealth visits remained at an average level of 11.4% (9.4–12.4%). Surveyed providers consider telehealth as an effective complement to in-person care and will continue its use (4.2/5 Likert scale).*

Conclusions: *Telehealth has become a viable pathway of care for OM and OMFS who previously did not utilize the remote platform to deliver healthcare. As a new treatment modality, telehealth is perceived as impactful in increasing access to specialty care by participating providers. NP visits are now almost completely in person, but telehealth continues for RPs. Ongoing demand for telehealth highlights urgency to develop appropriate standards and effective remote diagnostic/monitoring tools to maximize telehealth's capability to leverage finite health care resources and increase access to specialty care.*

Keywords: *telehealth, teledentistry, specialty care, oral medicine, oral and maxillofacial surgery, health care access*

Introduction

The COVID-19 global pandemic propelled telehealth to the forefront when health care systems struggled to safely deliver care amid lockdowns and significant resource limitations. Before its onset, most health care providers did not have much experience delivering care remotely. Furthermore, most providers received very limited telehealth training as it was sporadically used in specific areas for interactive patient education, triaging, and minor long-distance care.

For health care specialties that did not require physical examinations and/or in-office testing (e.g., psychiatry), telehealth was readily adopted and had the smallest decline in overall visits during the height of the pandemic. However, specialties that required in-person diagnostic examinations (e.g., surgery) lost most of their visit volumes early on during the pandemic's onset and had little telehealth use.[1]

Oral medicine (OM) is the specialty of dentistry responsible for the oral health care of medically complex patients and for the diagnosis and management of medically related diseases, disorders, and conditions affecting the oral and maxillofacial region; whereas oral and maxillofacial surgery (OMFS) is the specialty of dentistry that includes the diagnosis, surgical and adjunctive treatment of diseases, injuries, and defects involving both the functional and esthetic aspects of the hard and soft tissues of the oral and maxillofacial region.[2]

This retrospective study analyzed telehealth's impact as a new treatment modality in these two highly specialized care settings, how it was received by providers who have not previously used the remote platform, and the types of encounters that adopted telehealth during the first 2 years of the pandemic.

Methods

STUDY DESIGN

Investigators implemented a retrospective study of patients who presented to the OM/OMFS specialty outpatient clinic in a university health system setting. The specialty outpatient clinic is a joint clinic for oral maxillofacial surgeons and OM specialists.

PATIENT SELECTION

Visit encounters for patients who presented to the specialty outpatient clinic prepandemic Year-0 (March 1, 2019, to February 28, 2020), Year-1 (March 1, 2020, to February 28, 2021), and Year-2 (March 1, 2021, to February 28, 2022) of the pandemic were included in the study. A telehealth appointment is defined as an audio-visual consultation that is initiated and completed through a virtual platform. Telehealth visits utilized in the specialty outpatient clinic included only synchronous phone or video visits. Patients were excluded as study subjects if the visit and/or billing was incomplete, or if the encounter was missing a diagnostic code. Encounters that were noted to be procedures or classified as for research purposes were also excluded.

DATA COLLECTION

Data collected included the type of encounter: new patient (NP) versus return patient (RP); platform of encounter: telehealth versus in person; and type of provider: OM versus OMFS. All health care providers were trained for telehealth encounters in the use of BlueJeans, a secure video application used by the specialty outpatient clinic as its standard video platform for all telehealth visits, as well as in the expanded use of Epic, an electronic medical record (EMR) software for data collection.

The University of Pennsylvania Human Research Protection Program (HRPP) and its Institutional Review Boards (PENN IRB) waived the need for ethics approval and the need to obtain consent for the collection, analysis, and publication of the retrospectively obtained and anonymized data for this noninterventional study. PENN IRB consists of Institutional Review Boards (IRBs) that are federally regulated entities within the HRPP with the mandate to review biomedical and social behavioral research studies that take place within or under the authority of the University of Pennsylvania and Penn Medicine to determine and ensure that all research meets certain established ethical, regulatory, and policy criteria to protect the rights and welfare of the human participants of such research.

VARIABLES

The primary dependent variable is telehealth versus in-person encounters. Primary independent variable is Year-1 versus Year-2 of the pandemic. The secondary independent variables are NP versus RP visits and OM versus OMFS.

DATA COLLECTION METHODS

Source data were obtained from Epic.

DATA AND STATISTICAL ANALYSIS

Data were graphed using Tableau and Microsoft Excel software, whereas statistical analysis was performed utilizing chi-squared test and analysis of variance (ANOVA).

Results

PREPANDEMIC DATA

In the year before the pandemic, there were 15,901 total patient visits, all of which were conducted in person. Of these encounters, 33% were NP visits and 67% were RP visits. Similar compositions of NP versus RP were observed between the two specialty services, with 34% NP and 66% RP encounters for OMFS, and 32% NP and 68% RP encounters for OM.

PANDEMIC (YEAR-1 AND YEAR-2) DATA

Figure 1 depicts the annual number of NP versus RP visits in Year-1 and Year-2 by encounter type (telehealth vs. in person). In Year-1 of the pandemic, there were a total of 11,640 patient encounters, of which 35% were NP visits and 65% were RP visits. Of the NP visits, 6% were telehealth visits, and

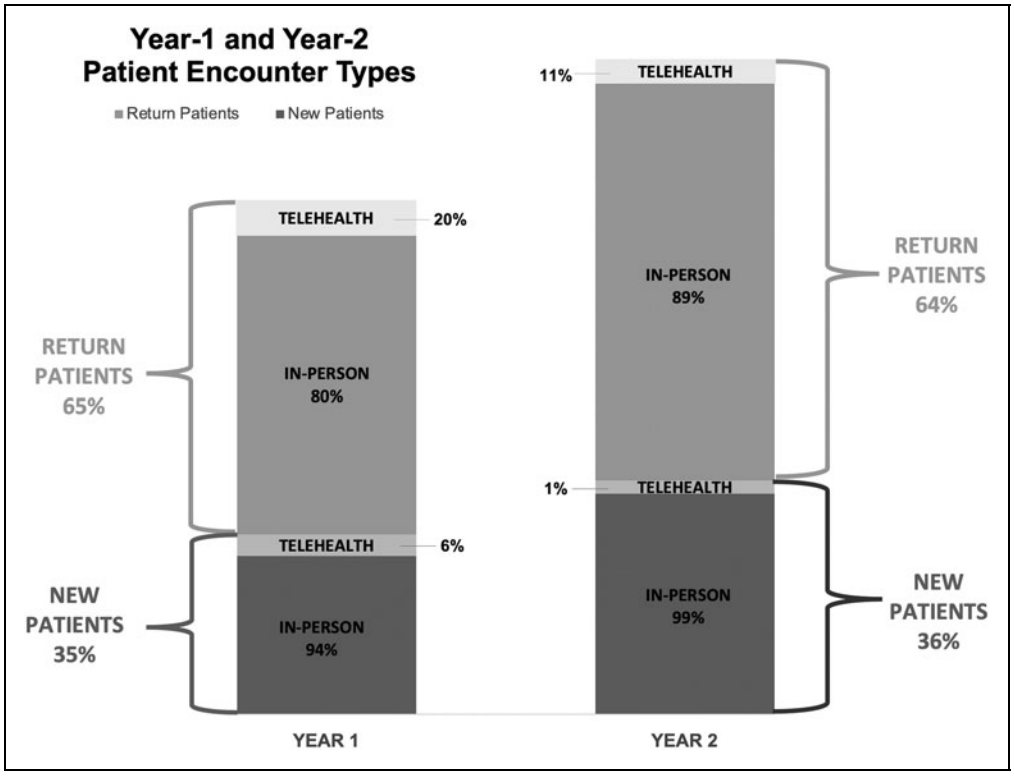

Fig. 1. Year-1 and Year-2 patient encounter types. Annual number of NP versus RP visits in Year-1 and Year-2 by encounter types (telehealth vs. in person). NP, new patient; RP, return patient.

94% were in-person visits. Of the RP visits, 20% were telehealth visits, and 80% were in-person visits. In Year-2 of the pandemic, there were a total of 14,729 patient encounters, of which 36% were NP visits and 64% were RP visits. Of the NP visits, 1% were telehealth visits and 99% were in-person visits. Of the RP visits, 11% were telehealth visits and 89% were in-person visits.

Overall, there was a decrease of 8% in the frequency of telehealth visits between Year-1 (15%) and Year-2 (7%) ($p = 0.0001$) of the pandemic. Moreover, the majority (87%) of all telehealth visits during this time was for RP visits. By August 2022, telehealth NP encounters have largely returned to prepandemic levels (0–1.5%), whereas telehealth RP visits remain at an average level of 11.4% (9.4–12.4%).

Table 1 depicts the distribution of patient encounters for Years 1 and 2 conducted in person versus telehealth, categorized by the following patient demographics: age, race, and gender. Over the course of the study, there was no statistically significant difference in telehealth utilization overall between age ($p = 0.925739$), race ($p = 0.477418$), and gender ($p = 0.673507$).

Of the 26,369 patient encounters in Years 1 and 2, 66% were for OMFS and 34% were for OM. OMFS utilized telehealth 12% of the time, whereas OM utilized telehealth 8% of the time. *Figure 2* depicts telehealth utilization during Year-1 and Year-2 by OM and OMFS categorized by NP versus RP visits. Telehealth utilization by both specialty services is similar in composition for both years, with RP visits accounting for all telehealth usage in Year-2.

Figure 3 depicts the monthly breakdown of telehealth and in-person visits for NP encounters by service type. OMFS had the highest percentage of telehealth NP encounters in April 2020 in Year-1 and March 2021 in Year-2, but none (0%) in December 2021, February 2022, and March 2022. Comparatively, OM had the highest percentage of NP telehealth visits in April 2020 in Year-1 and in March 2021 in Year-2, but without any (0%) NP telehealth encounters from May 2021 until March 2022.

Figure 4 depicts the monthly breakdown of telehealth and in-person encounters for RP visits by service type. In Year-1, there were 5,075 OMFS RP visits, of which 21% were conducted through telehealth; whereas in Year-2, there were 6,260 OMFS RP visits, of which 13% were telehealth encounters. This is an overall telehealth utilization of 17% by OMFS for RP visits in the first 2 years of the pandemic. Meanwhile, there were 2,468 OM RP visits in Year-1, of which 19% were conducted through telehealth; whereas in Year-2, there were 3,265 OM RP visits, of which 8% were telehealth encounters. This is an overall telehealth utilization of 13% by OM for RP visits in the first 2 years of the pandemic.

Table 1. Demographics Distribution of Total Patient Encounters Conducted in Person Versus Telehealth Categorized by Age, Race, and Gender

PATIENT ENCOUNTERS			
AGE (YEARS)	**IN PERSON**	**TELEHEALTH**	***P***
0–17	91% (1,508)	9% (150)	0.925739
18 and 19	92% (880)	8% (74)	
20–29	89% (3,360)	11% (414)	
30–39	87% (2,499)	13% (389)	
40–49	87% (2,349)	13% (341)	
50–59	88% (3,765)	12% (520)	
60–69	89% (5,164)	11% (630)	
70–79	92% (3,934)	8% (331)	
80+	92% (1,360)	8% (118)	
RACE	**IN PERSON**	**TELEHEALTH**	***P***
Asian	90% (1,074)	10% (118)	0.477418
Black	92% (3,056)	8% (282)	
Other	90% (5,044)	10% (583)	
White	89% (15,744)	11% (1,984)	
GENDER	**IN PERSON**	**TELEHEALTH**	***P***
Female	88% (15,598)	12% (2,167)	0.673507
Male	92% (9,221)	8% (800)	

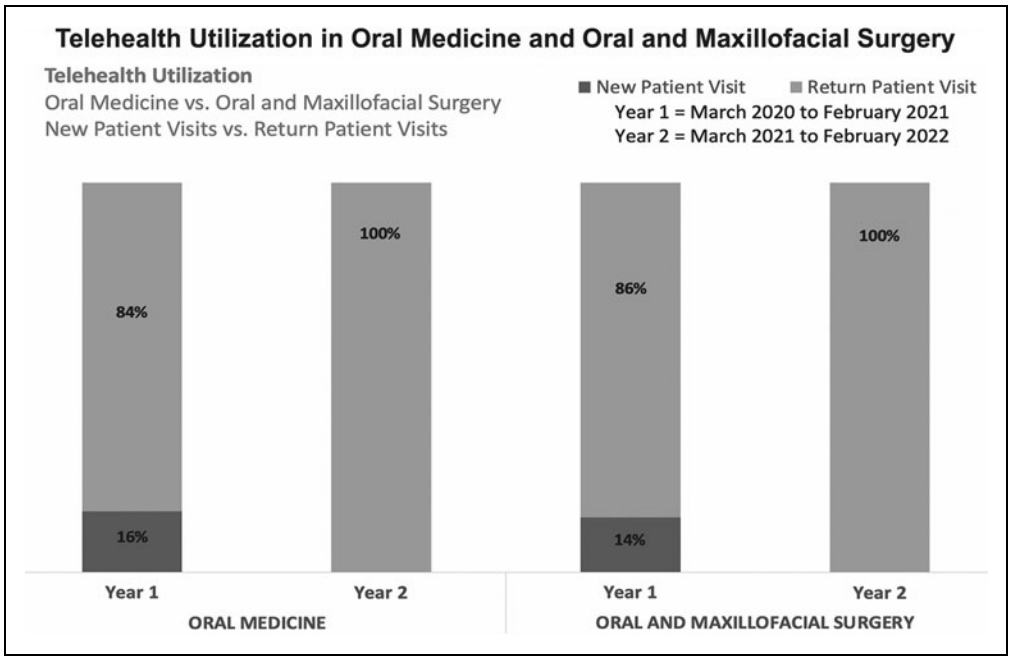

Fig. 2. Telehealth utilization in OM and OMFS. Telehealth utilization by OM and OMFS in Year-1 and Year-2 categorized by NP versus RP visits. OM, oral medicine; OMFS, oral and maxillofacial surgery.

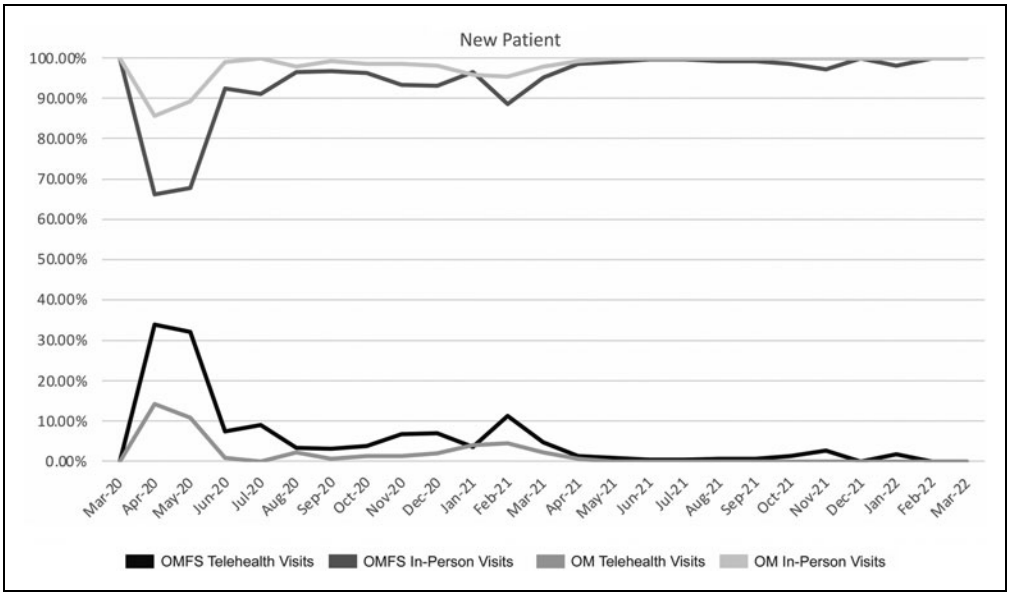

Fig. 3. NP encounters by service type. Monthly breakdown of telehealth and in-person visits for NP encounters in Year-1 and Year-2 by service type (OM and OMFS).

SPECIALTY CARE PROVIDER SURVEY

A retrospective survey of OM and OMFS specialty care providers was conducted regarding their telehealth experience and satisfaction with the remote platform. *Figure 5* presents the results of a six-question provider survey based on a 5-point Likert scale. The survey results indicate a positive reception overall by the surveyed providers, with telehealth perceived as having a legitimate value as an additional pathway of care (4.2), is thought to be an effective complement to in-person care even in the highly specialized practices

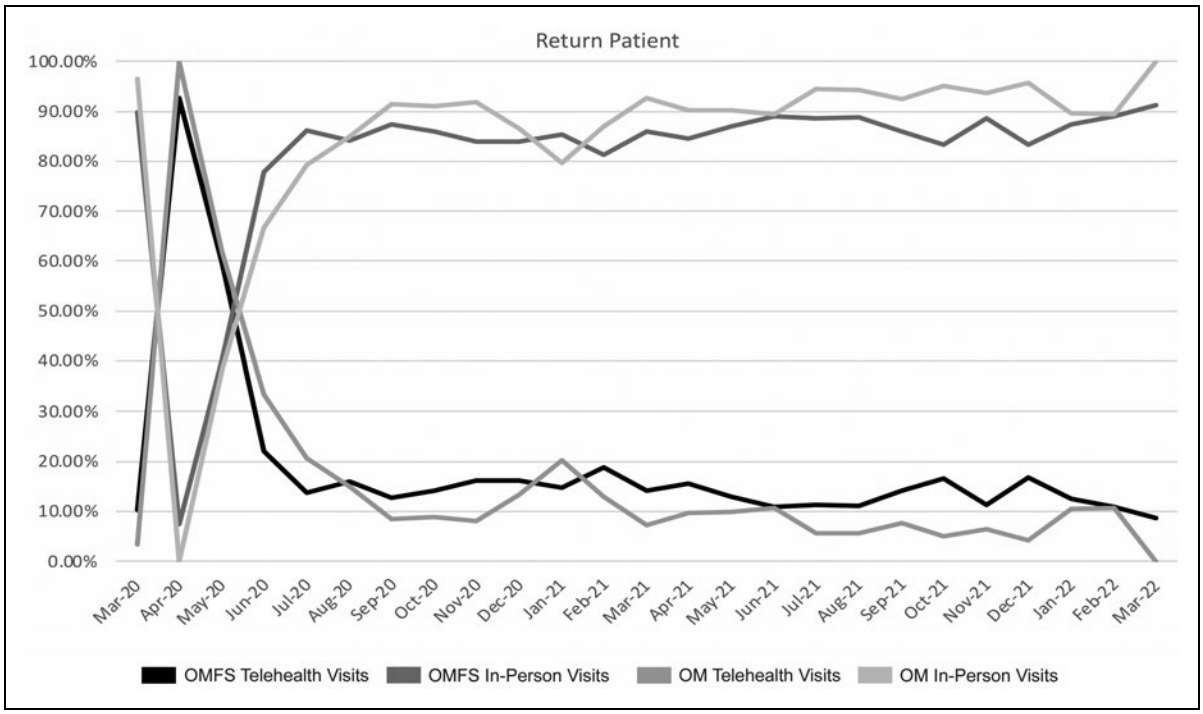

Fig. 4. RP encounters by service type. Monthly breakdown of telehealth and in-person visits for RP encounters in Year-1 and Year-2 by service type (OM and OMFS).

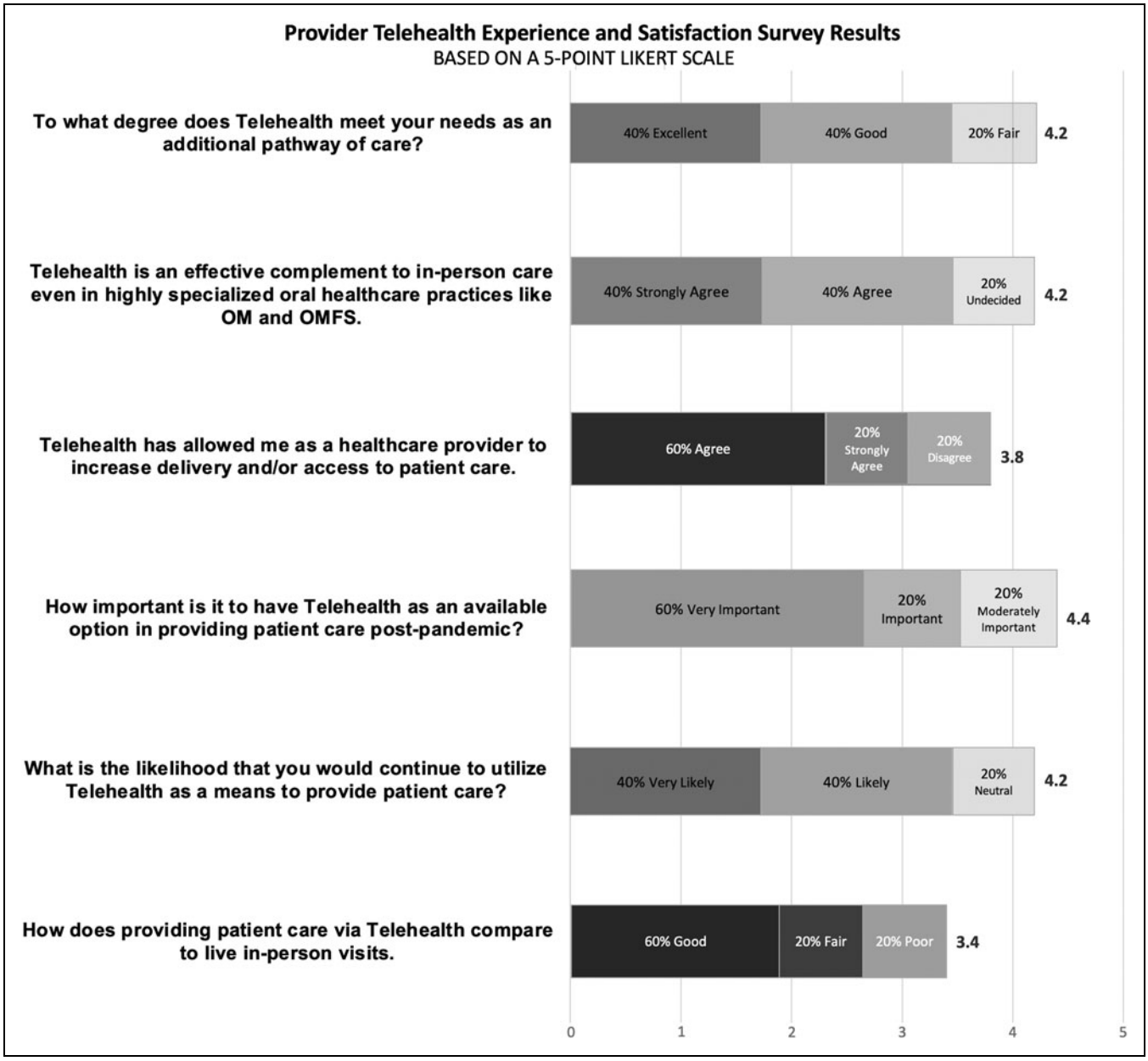

Fig. 5. Provider telehealth experience and satisfaction survey results. Provider survey responses regarding telehealth experience and satisfaction with the remote platform based on a 5-point Likert scale.

of OM and OMFS (4.2), and has allowed providers to increase delivery and/or access to patient care (3.8).

Survey results also reveal that although provider respondents indicate that it is very important to have telehealth as an available treatment modality even postpandemic (4.4) and that most will continue to utilize the remote platform (4.2), providing patient care through telehealth still falls short to in-person encounters (3.4).

Discussion

After executive orders to restrict all procedures that were nonemergent from March 18, 2020, to April 27, 2020,[3] the specialty outpatient clinic adopted telehealth as a new treatment modality to be able to deliver OM and OMFS services.

In this study, 87% of all telehealth encounters in the first 2 years of the pandemic were for RP visits. The adoption of telehealth early in the pandemic (particularly for RP visits) is

documented in the literature; specifically in oral surgery wherein telehealth has been noted to decrease the number of in-person follow-up visits with higher perceived cost-effectiveness and satisfaction, compared with in-person visits.[4,5]

The continued demand for and utilization of telehealth, especially for RP visits, confirm its viability as a treatment modality for OM and OMFS. Furthermore, based on the surveyed providers' feedback, telehealth is considered to be a beneficial addition to the two specialties not only as an effective complement to in-person encounters, but also as an instrument that has allowed for an increase in delivery and/or access to their specialized services.

This study revealed that telehealth can have significant value even in specialty care practices such as OM and OMFS who previously did not utilize the remote platform to deliver healthcare. Telehealth extends the reach of specialty services and provides opportunities to reduce access barriers such as those based on geography and socioeconomics.[6–8] In addition, studies have shown that in addition to increasing access to care, telehealth has demonstrated a decrease in wait times for specialists and in the number of no-show appointments, higher treatment completion rates, and, as a result, improvement in prognosis of various diseases through earlier detection.[9,10]

Furthermore, this study's findings indicate that telehealth utilization is consistent and equitable across age, race, and gender, further supporting its value as a critical component for successful transition toward digital medicine in the future.

FUTURE AND LIMITATIONS

Telehealth has an enormous potential to improve access to specialty care services such as OM and OMFS. It can help mitigate barriers to in-person visits (e.g., need for transportation, childcare, missed work, and school) and is now available to a significant portion of the population given that the only requirements to participate are internet access and a mobile phone or device. In a survey conducted by Pew Research Center in February of 2021, the vast majority of Americans (97%) own a cellphone, whereas the share of Americans who own a smartphone is now 85%, up from just 35% in the first survey of smartphone ownership initially conducted in 2011.[11]

Telehealth's considerable potential to improve access beyond primary care can also be further maximized by the development of more effective remote diagnostic tools with monitoring capabilities to increase the remote platform's applicability in health care utilization. Specific to OM and OMFS, in-person intraoral examinations remain the gold standard. The development of a digital tool that will allow for comparable remote intraoral examinations can further expand telehealth's capabilities, and consequently, its impact in increasing access to OM and OMFS services, as well as to other similar specialties.

Moving forward, it is also important to consider the formalization of telehealth protocols and its integration into education and research initiatives that can help standardize remote visits and improve not only delivery, but also quality of remote care. The incorporation of telehealth curricula into dental, medical, and advanced health care education is vital for success in the postpandemic environment that is swiftly moving toward digital medicine.

Conclusion

The COVID-19 pandemic propelled the inevitable telehealth revolution forward and demonstrated the power of remote health care. Even for specialties such as OM and OMFS that rely on in-person diagnostic examinations, telehealth has become a viable pathway of care, effectively transforming specialty care practice. This study found that the adoption of telehealth as a new treatment modality is thought to be an effective complement to in-person encounters by OM and OMFS providers who continue to utilize the remote platform postpandemic.

Provider respondents also perceive the use of telehealth as impactful in increasing delivery of and access to their specialized services. Although NP visits are now almost completely in person, telehealth utilization has continued for RP visits. The ongoing demand for telehealth appointments in OM and OMFS affirms its value as an effective treatment mechanism even though in-person examinations remain the gold standard.

Authors' Contributions

All authors listed below have made substantial contributions to the conception and design of the study, acquisition of data, or analysis and interpretation of data, drafting the article or revising it critically for important intellectual content, and final approval of the version to be submitted. Study conception and design were carried out by A.M.-H., P.H., T.C., M.J.C., K.F., S.D., R.S., J.F., P.W.-S., D.V.M., and AD.L.

Data collection was done by T.C. Data analysis and interpretation of results, tables, figures, and graphs were carried out by P.H., A.M.-H., T.C., M.J.C., K.F., S.D., R.S., J.F., P.W.-S., D.V.M., and A.D.L. Draft article preparation was carried out by A.M.-H. Revisions, reviews, and editing were carried out by A.M.-H., P.H., T.C., M.J.C., K.F., S.D., R.S., J.F., P.W.-S., DV.M., and A.D.L. Final article preparation and submission were done by A.M.-H.

Disclosure Statement

The authors have no affiliations with or involvement in any organization or entity with any financial interest (such

as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or nonfinancial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this article.

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