



Patient and providers' satisfaction with tele(oral)medicine during the COVID-19 pandemic

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In addition to the unprecedented high death toll and the devastating economic impact, the coronavirus disease 2019 (COVID-19) pandemic has also caused great disruption to nearly 200,000 dental providers in the United States (Eklund & Bailit, 2017; Munson & Vujcic, 2018). The coronavirus (SARS-CoV-2) is present in respiratory secretions and saliva of infected patients and is spread through respiratory large droplets (Bahl et al., 2020; Tay et al., 2020; Xu et al., 2020). Because of aerosol-generating procedures in oral healthcare settings and close person-to-person contact, dental providers, auxiliaries and their patients are at high risk of infection ("The New York Times (New York) March, 2020"). Due to these concerns, all routine dental services were suspended for more than two months (American Dental Association, 2020).

Telehealth offers providers the opportunity to provide continuity of care, triage patient's concerns and relieve patient's anxiety regarding oral/mucosal issues. Patient care can be delivered in a timely and safe manner allowing for evaluation of oral mucosal disorders, and to address pain, some forms of minor bleeding, swelling and other postoperative complications that may not necessarily require a face-to-face consultation thus reducing the risk of potential exposure to COVID-19. In response to the recent COVID-19 pandemic, several oral medicine practices in North America established tele(oral)medicine services to provide virtual patient care and continuity of clinical education for dental and oral medicine trainees (Villa et al., 2020). Telemedicine has been widely adopted by the medical profession for more than four years (Bashshur & Armstrong, 1976; Conrath et al., 1977; Muller et al., 1977) and has been well received by both patients and providers (Hollander & Sites, 2020). Telehealth visits in the medical field have increased rapidly since the recent

COVID-19 outbreak began, yet telehealth in the oral medicine/dental community has not to our knowledge been widely utilized.

The aim of this multicenter cross-sectional study was to assess patient and provider's satisfaction, experiences, acceptance and engagement in using tele(oral)medicine during the COVID-19 pandemic with the hope to provide helpful information to other colleagues who are looking to implement future tele(oral)medicine programs.

This study was conducted at three oral medicine centers in the United States that started tele(oral)medicine since the beginning of the COVID-19 pandemic. Patients and oral medicine providers were invited to complete an anonymous survey at the end of each video visit. The study was approved by the Institutional Review Board of Tufts University, University of California San Francisco (UCSF), and University of North Carolina (UNC), Chapel Hill.

A modified version of a previously validated survey was administered to providers that transitioned in-person visits to tele(oral) medicine visits (Glaser et al., 2010). Briefly, the survey queried on overall satisfaction with the video visit, comfort level with the video technology (quality of the video and sound) and willingness to use telemedicine in the future. Patients who underwent video appointments via Zoom (Zoom Video Communications, Inc.) and or WebEx answered survey questions via Qualtrics (UCSF and UNC) or on paper (Tufts) at the end of each encounter. Patient experience was measured in multiple items. Sociodemographic characteristics including gender, age, and type of insurance were collected as well.

A total of 100 patients (23.5%; 100/425) responded to the survey from April 1st to July 30, 2020 (Table 1). The majority of patients were females (73.9%), White (76.6%), with a median age of 61 years (23–81) and a household's annual income >\$ 100,000 in 53.7% of

TABLE 1 Patients' characteristics (N = 100)*

	N*	%
Site		
UCSF	55	55.0%
UNC	10	10.0%
Tufts	35	35.0%
Gender		
Female	48	73.9%
Male	17	26.2%
Median age (range)	61 (23–81)	
Race		
Black or African American	4	6.3%
Other	5	7.8%
Asian	6	9.4%
White	49	76.6%
Education		
Less than high school	1	1.5%
High school graduate	4	6.2%
Some college/professional degree	14	21.5%
Graduate school	18	27.7%
College degree	28	43.1%
Household's annual income		
Less than \$10,000	2	3.7%
\$10,000–\$19,999	1	1.9%
\$20,000–\$39,999	6	11.1%
\$40,000–\$59,999	4	7.4%
\$60,000–\$79,999	7	13.0%
\$80,000–\$99,999	5	9.3%
\$100,000–\$149,999	11	20.4%
More than \$150,000	18	33.3%
Insurance type		
Medicaid	1	1.6%
Other	6	9.7%
Dental	13	21.0%
Medical	16	25.8%
Medicare	26	41.9%
How many miles would you have travelled if you did not use telehealth today?		
0–5	11	12.6%
6–14	1	1.2%
15–30	18	20.7%
31–60	15	17.2%
>60	42	48.3%

Note: N*: Numbers do not add up to 100 due to some missing responses.

TABLE 2 Patients' survey for tele(oral)medicine visits (N = 100)

	N*	%
What device did you use for the interview?		
Tablet	11	12.1%
Desktop	14	15.4%
Smartphone	19	20.9%
Laptop	47	51.7%
I was able to communicate adequately with the specialist		
Neutral	1	1.0%
Somewhat disagree	1	1.0%
Somewhat agree	6	6.1%
Strongly agree	90	91.8%
The specialist was able to understand what was bothering me today		
Strongly agree	90	92.8%
Somewhat agree	6	6.2%
Strongly disagree	1	1.0%
The oral exam was embarrassing to me because it was done on a video and not in person		
Somewhat agree	5	5.3%
Strongly agree	9	9.6%
Neutral	13	13.8%
Somewhat disagree	23	24.5%
Strongly disagree	44	46.8%
I had difficulty hearing the specialist over the telemedicine system		
No	61	93.9%
Yes	4	6.2%
I had difficulty seeing the specialist over the telemedicine system		
No	63	98.4%
Yes	1	1.6%
Telemedicine made it easier to get oral/medical care today		
Strongly disagree	1	1.0%
Somewhat disagree	4	4.1%
Neutral	8	8.3%
Somewhat agree	17	17.5%
Strongly agree	67	69.1%
I would have gotten better care if I had seen the specialist in person		
Strongly agree	5	7.7%
Somewhat disagree	8	12.3%
Somewhat agree	14	21.5%
Neutral	16	24.6%
Strongly disagree	22	33.9%
Overall, I was very satisfied with today's telemedicine session		
Neutral	1	1.0%
Strongly disagree	1	1.0%
Somewhat agree	13	13.3%
Strongly agree	83	84.7%



TABLE 2 (Continued)

	N*	%
The next time I would prefer to see the specialist in person despite the possible inconvenience		
Somewhat disagree	7	10.8%
Strongly agree	7	10.8%
Strongly disagree	9	13.9%
Somewhat agree	15	23.1%
Neutral	27	41.5%

Note: N*: In some cases, numbers may not add up to 100 due to some missing responses.

TABLE 3 Providers' survey for tele(oral)medicine visits (N = 108)

	N*	%
The Telehealth visit from today improved patient access to oral medicine services		
Somewhat agree	7	7.30%
Neutral	10	10.40%
Agree	15	15.60%
Completely agree	64	66.70%
The telehealth system was a convenient way for my patient to access oral medicine services		
Somewhat agree	10	9.50%
Neutral	12	11.40%
Agree	16	15.20%
Strongly agree	23	21.90%
Completely agree	44	41.90%
I think the telehealth visit was an adequate replacement for this specific patient		
Completely disagree	4	3.8%
Somewhat disagree	6	5.7%
Disagree	14	13.3%
Neutral	16	15.2%
Somewhat agree	10	9.5%
Agree	20	19.1%
Completely agree	35	33.3%
Based on your perception about today's telemedicine visit, how satisfied are you with today's telemedicine outcome?		
Very dissatisfied	2	2.0%
Somewhat dissatisfied	11	10.9%
Neutral	18	17.8%
Somewhat satisfied	32	31.7%
Very satisfied	38	37.6%
The oral examination was easy to perform		
Completely disagree	5	5.0%
Somewhat disagree	8	8.0%
Disagree	29	29.0%
Neutral	26	26.0%

(Continues)

TABLE 3 (Continued)

	N*	%
Somewhat agree	3	3.0%
Agree	16	16.0%
Completely agree	13	13.0%
I had difficulty hearing the patient over the telemedicine system		
Completely disagree	30	43.5%
Disagree	25	36.2%
Neutral	4	5.8%
Agree	8	11.6%
Completely agree	2	2.9%
I felt the resolution of the video during the intra-oral examination was sufficient		
Completely disagree	4	5.80%
Disagree	16	23.2%
Neutral	11	15.9%
Agree	20	29.0%
Completely agree	18	26.1%
I felt the patient medical/dental history and other information collected were sufficient		
Disagree	3	4.4%
Neutral	3	4.4%
Agree	22	31.9%
Completely agree	41	59.4%
Did patient require a biopsy today?		
No	21	70.0%
Yes	9	30.0%

Note: N*: In some cases, numbers may not add up to 108 due to missing responses.

cases. Most patients (41.9%) had Medicare coverage; 25.8% patients had medical insurance and 21.0% had private dental insurance. Forty-two patients (48.3%) would have travelled >60 miles to see the oral medicine specialist if tele(oral)medicine was not an option. The most common device used for the video consult was a laptop (51.7%) followed by smartphone (20.9%), desktop (15.4%), and tablet (12.1%; Table 2).

Most patients felt they were able to communicate well with the specialist via video (91.8%) and that the specialist was able to understand their main oral related problem (92.8%). Almost two thirds of patients thought tele(oral)medicine made it easier to get their care and 84.7% were very satisfied with the telehealth session. A small percentage of patients thought they would have gotten better care if they had seen the specialist in person ("strongly agree": 7.7%).

Nine oral medicine specialists responded to the survey for a total of 108 visits. Full details and responses are reported in Table 3. Providers thought that tele(oral)medicine improved patient access to oral medicine services in 82.3% of cases and "agreed" or "completely agreed" that telehealth was an adequate replacement for their patients in 49.4% of the visits. Providers were "somewhat satisfied" or

“very satisfied” with the tele(oral)medicine outcome in 31.7% and 37.6% of the cases, respectively. Thirty percent of the patients required a biopsy after the video consultation.

The COVID-19 pandemic caused great disruption to the dental community and is shaping how we will deliver care for the years to come. Our study showed that tele(oral)medicine was well received among patients and providers. As oral medicine practices gradually return to in-person patient visits, telemedicine still remains a safe and effective option for patients with certain oral mucosal or pain disorders. Tele(oral)medicine has shown to be a convenient and effective healthcare delivery technology for those individuals that have limited access to care from oral medicine specialists.

CONFLICT OF INTEREST

None to declare.

AUTHOR CONTRIBUTIONS

Alessandro Villa: Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Project administration; Validation; Writing-original draft. **Vidya Sankar:** Conceptualization; Writing-review & editing. **Ali Shazib:** Methodology; Writing-review & editing. **Daniel Ramos:** Investigation; Writing-review & editing. **Piri Veluppillai:** Investigation; Writing-review & editing. **Ava Wu:** Data curation; Writing-review & editing. **Caroline Helene Shiboski:** Conceptualization; Investigation; Methodology; Writing-review & editing.

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