Ohio Journal of Public Health, Vol. 8 Issue 1 ISSN: 2578-6180

RESEARCH ARTICLE

Attitudes Toward Dental Care, Teledentistry, Vaccination, and Safety Precautions 18 Months Post-COVID-19 Outbreak in Ohio

David O. Danesh[1,2]; Taylar Rowe[1,2]; Andy Ai Ni[3]; Wei-En Lu[4]; Homa Amini[1,2]

[1] Division of Pediatric Dentistry, College of Dentistry, The Ohio State University, Columbus, OH
[2] Nationwide Children's Hospital, Columbus, OH
[3] Division of Biostatistics, College of Public Health, The Ohio State University, Columbus, OH
[4] Department of Statistics, The Ohio State University, Columbus, OH

Corresponding Author: David O. Danesh, 700 Children's Drive, Columbus, OH 43205, 614-772-5650, david.danesh@nationwidechildrens.org
Submitted May 2, 2025 Accepted September 16, 2025 Published January 22, 2026 https://doi.org/10.18061/ojph.6410

ABSTRACT

Background: This study evaluates attitudes of Ohioans toward dental care, teledentistry, vaccination, and safety precautions after the COVID-19 outbreak.

Methods: An online survey was completed by Ohio residents ages 18 years or older between October and December 2021. The questionnaire collected demographic data and assessed attitudes toward dental care, teledentistry, and vaccinations in the COVID-19 era.

Results: Among survey respondents (n=66), many felt comfortable visiting the dentist during the COVID-19 pandemic (59.1%) while some reported they would only visit the dentist if they have an emergency (13.6%). There was a significant association between age and perceived risk at the dental office. The majority (78.3%) reported having had a dental visit during the pandemic and expressed safety measures in the dental office made them feel safe (75.8%). Over half (68.2%) felt these measures should continue after the pandemic has ended. There was a significant association between having received an influenza vaccination and willingness to receive the COVID-19 vaccine. Less than a third of respondents (31.8%) were interested in consultation via teledentistry, although almost all respondents (93.9%) were willing to fill out information for an in-person appointment online. Higher income individuals, those with private insurance, and Whites were less likely to be interested in teledentistry.

Conclusion: Overall, Ohioans felt comfortable with visiting the dental office following the COVID-19 pandemic and safety precautions appeared to reduce patient fear. Patients reported some hesitancy with receiving a vaccine. Integrating technology, like teledentistry, in dental practice is a promising avenue for patient care.

Keywords: COVID-19 vaccine; Teledentistry; Dental care; Oral health literacy; Cross-sectional survey

INTRODUCTION

Almost 4 million Ohioans suffered from COVID-19 from 2020 to 2025, leading to over 150 000 hospitalizations, 16 000 intensive care unit admissions, and 44 000 deaths in the state of Ohio as of March 2025.[1] In Ohio, a state of emergency was declared on March 9, 2020, with a stay at home order announced on March 22, 2020, followed by several public health mandates and initiatives to slow the progression of the outbreak. At the national level, the pandemic-related emergency orders initially led to closure of most US dental clinics to all but urgent and emergency care.[2] On May 1, 2020, health care offices, including dental offices, were allowed to reopen in Ohio, while on June 2, 2021, most of the pandemic health orders were rescinded or lifted.[3]

The introduction of COVID-19 vaccines gave some people more confidence in pursuing dental care (and resuming normal life) while

introducing vaccine hesitancy for others. Previous research has examined COVID-19 vaccine intention, acceptance, and receipt in Ohio.[4-9] A previous survey of Ohioans from August 2021 to August 2023 found that participants in metropolitan counties were twice as likely to receive a COVID-19 vaccine compared to those living in nonmetropolitan counties.[8] Reasons for COVID-19 vaccine hesitancy from previous research based in Ohio includes lack of trust in government, belief the vaccine is not needed, is too new, or unsafe, and concerns for other comorbidities to interfere with the vaccine.[9] State-level data reported by the Ohio Department of Health shows that the number of people who received at least one valid dose of COVID-19 vaccine (from manufacturers Moderna, Pfizer-BioNTech, Johnson & Johnson/Janssen, or Novavax) between December 2020 and November 2023 was 7 600 000 (or about 65% of the population).[1]

COVID-19 influenced consumer attitudes and health care utilization including delays in pursuing dental care and anxiety about the safety of dental care.[10-15] Due to the risk of contracting COVID-19, there was some fear in returning to the dental office when restrictions were lifted. Kranz et al reported that half of the US adults delayed dental care due to COVID-19 during the spring of 2020.[12] A 2020 survey among people in the United States found 52% of respondents were ready to go back to a dentist, 22% of respondents had already gone back to the dentist, 15% needed a medical breakthrough (vaccine or proven remedy) before feeling comfortable returning, and 11% needed assurance from medical experts and officials that it is safe to do so.[16,17] Follow-up surveys in 2022 found that, starting in 2020, more than 70% of respondents were either ready to go back to the dentist or had already visited a dentist's office, slowly increasing to above 90% in April 2021 and later.[18]

Many of the COVID-19 mandates and clinical recommendations to mitigate exposure risk for dental providers and patients were implemented in dental clinics, limiting the number of patients in the dental office at the same time, limiting treatment to urgent or emergent care, and utilizing teledentistry.[11,12,15,19] Teledentistry utilizes technology via synchronous or asynchronous communication between patients and the dental team to provide dental care.[19] Although teledentistry is still developing with challenges and considerations, it became a useful tool during the COVID-19 pandemic to connect patients to dental care.[13,15] Teledentistry continues to be a high quality, cost-effective, safe, and effective tool in dentistry.[19] In Ohio, the dentistry team at Nationwide Children's Hospital has continued to engage with teledentistry.[20,21] Anecdotally, other dental clinics in Ohio, including safety net dental clinics, have also engaged with teledentistry or plan to integrate teledentistry.

Patient-reported positive experiences with teledentistry during the COVID-19 pandemic and after in the US and internationally included patient benefits such as ease of use, effectiveness, reliability, safety, and saving travel time and costs.[21-26] The purpose of this cross-sectional survey research study is to investigate Ohio adults' perceptions and attitudes toward dental care, teledentistry, vaccination, and safety precautions 18 months after the COVID-19 outbreak. The public health implications of this study are important and useful for Ohio dental providers, health care providers, and public health professionals to understand the attitudes of patients related to dental care, teledentistry, and vaccination.

METHODS

In this study, a self-administered online REDCap cross-sectional survey was conducted via ResearchMatch, a national health volunteer registry that was created by several academic institutions and supported by the US National Institutes of Health as part of the Clinical Translational Science Award (CTSA) program.[27] ResearchMatch has a large population of volunteers who have consented to be contacted by researchers about health studies for which they may be eligible.[27] This study was deemed exempt by The Ohio State University institutional review board (IRB #2021E0378). Inclusion criteria were Ohio residents aged 18 years or older with access to ResearchMatch (n=1500). The survey questions were developed based on literature review and adapted from previously published survey instruments.[16,17] The survey was pilot-tested by the study authors, then administered from October 2021 through December of 2021. The 17-item questionnaire collected demographic data and assessed attitudes toward dentistry including comfort level with visiting a dentist, teledentistry, vaccination, source of COVID-19 information and safety precautions during COVID-19 pandemic. The entire survey took approximately 5 minutes to complete, and participants received no financial incentive for their participation. Participation was anonymous and participant confidentiality was protected.

Data analysis was conducted using R (version 4.0.2).[28] Descriptive statistics were used to summarize participant characteristics and responses to survey questions. To examine whether participant characteristics were associated with responses to certain questions, Fisher exact test was used. A P value $\leq .05$ was considered significant.

RESULTS

Among the 1500 eligible participants via ResearchMatch, 66 people responded to the survey. The majority of survey respondents were over age 35 years (68.2%), female (75.8%), White (89.4%) and had private insurance coverage (72.7%). Table 1 provides a summary of respondent characteristics. Over half (68.2%) of the respondents reported a history of a dental visit within the last 6 months. There was a significant association between age and last visit to the dentist. It appears that as age increases, the probability of visiting the dentist within 6 months increases (P=0.048). While over half (59.1%) reported feeling comfortable visiting the dentist during the COVID-19 pandemic, 13.6% reported they will only visit the dentist if they have an emergency/pain. A significant association between age and perceived risk at the dental office existed (P=0.05) in which older participants were more likely to feel at risk at the dental office than younger participants. Only a few (1.5%) reported being afraid of going to the dentist due to fear of contracting COVID-19 at the dental office. Most (78.3%) reported having had a dental visit during the pandemic. The majority (75.8%) expressed safety measures such as temperature taking, screening questions, social distancing, face shields, N95 masks, gowns, and high-vacuum suction machines make

Table 1. Demographic Characteristics of Respondents

	N	%
Total	66	100.0%
Gender		
Male	14	21.2%
Female	50	75.8%
Non-binary	1	1.5%
Prefer not to answer	1	1.5%
Age (years)		
18-24	7	10.6%
25-34	10	15.2%
35-44	21	31.8%
45-54	6	9.1%
55-64	8	12.1%
≥ 65	10	15.2%
No response	4	6.1%
Race		
Black or African American	5	7.6%
White	59	89.4%
Unknown/Prefer not to answer	2	3.0%
Ethnicity		
Hispanic or Latino	4	6.1%
Not Hispanic or Latino	60	90.9%
Unknown/not reported	1	1.5%
Income		
Less than $20 000	9	13.6%
$20 000-$49 999	13	19.7%
$50 000-$100 000	22	33.3%
Greater than $100 000	13	19.7%
No response	9	13.6%
Insurance		
Government-funded/public (Medicaid, Molina, CareSource, etc.)	9	13.6%
Private	48	72.7%
None	7	10.6%
No response	2	3.o%
Last dental visit		
Within 6 months	45	68.2%
Between 6 months and 1 year	5	7.6%
More than 1 year	15	22.7%
No response	1	1.5%

them feel safe. Interestingly, 68.2% felt these safety measures should continue after the pandemic has ended (Table 2.)

Many participants obtained most of their information about COVID-19 from the news or online sources (Table 2). The majority (81.8%) reported they will get the COVID-19 vaccine when it is offered, and about half (54.5%) reported having received the flu shot this year. Age and income were significantly associated with having received the flu shot (Table 3). Older age and with higher income were positively associated with flu vaccination. There was also a significant association between having received the flu shot and willingness to receive the COVID-19 vaccine (Table 4).

Although 93.9% of respondents said they would be willing to fill out health history, dental history forms, and insurance questions electronically instead of doing this in the office, only 31.8% expressed an interest in online consultation and screening prior to the dental appointment with teledentistry. There was a significant association with income, insurance, race, and teledentistry. It appears that higher income individuals, those with private insurance, and Whites were less likely to be interested in teledentistry (Table 5).

Table 2. Respondents' Attitude Toward Dental Visit, Safety Precautions, Teledentistry, and COVID-19 Information Source

	N	%
Total	66	100.0%
Which statement best describes your attitude toward dental visit during COVID-19 pandemic?		
I am comfortable visiting the dentist during COVID-19 pandemic.	39	59.1%
I will visit the dentist once there is a vaccine.	1	1.5%
It depends on what safety measures the dental office offers.	14	21.2%
I am afraid of going to the dentist because I am afraid of contracting COVID-19 there.	1	1.5%
I will only visit the dentist if I have an emergency/pain.	9	13.6%
No response	2	3.0%
Will you get the COVID-19 vaccine when it is offered?		
No	11	16.6%
Yes	54	81.8%
No response	1	1.5%
Did you get the flu shot this year?		
No	29	43.9%
Yes	36	54.5%
No response	1	1.5%
Would you be interested in teledentistry (online consultation and screening prior to the appointment to assess your dental needs)?		
No	44	66.7%
Yes	21	31.8%
No response	1	1.5%
If you have access to a computer and internet, would you be willing to fill out health history, dental history forms, insurance questions, etc electronically instead of doing this in the office?		
No	3	4.5%
Yes	62	93.9%
No response	1	1.5%
If you visited the dentist since the outbreak of COVID-19, do you feel that enough precautions were taken by the dental office to protect you and others?		
No	4	6.1%
Yes	48	72.2%
I haven't been to the dentist since the pandemic began.	13	19.7%
No response	1	1.5%
Do you feel like you are at risk by visiting your dental office?		
No	45	68.2%
Yes	20	30.3%
No response	1	1.5%
Which statement most reflects your feelings toward safety measures taken at the dentist (temperature taking, screening questions, social distancing, face shields, N95 masks, gowns, high-vacuum suction machines, etc)?		
I like the precautions and they make me feel safe.	50	75.8%
I think that dental facilities need to have more precautions.	8	12.1%
I think there are too many unnecessary precautions that are being taken.	2	3.0%
The precautions make me more uneasy about going to the dentist.	3	4.5%
No response	3	4.5%
Do you feel that these safety measures should continue after the pandemic?		
No	20	30.3%
Yes	45	68.2%
No response	1	1.5%
Where do you get most of your information about COVID-19?		
The news	18	27.3%
Online	16	24.2%
Research articles	16	24.2%
Friends/family	2	3.0%
Your doctor	9	13.6%
Other	5	7.5%

Table 3. Association of Flu Shot with Demographics

Variable	Flu Shot No N (%)	Flu Shot Yes N (%)	*P* value
Age (years) (N=62)			
18-24	2 (28.6%)	5 (71.4%)	0.024*
25-34	5 (5.0%)	5 (5.0%)	
35-44	10 (47.6%)	11 (52.4%)	
45-54	2 (3.3%)	4 (66.7%)	
55-64	5 (62.5%)	3 (37.5%)	
≥ 65	10 (1.0%)	0 (0%)	
Income (N=57)			
Less than $20 000	7 (28.0%)	2 (6.2%)	0.029*
$20 000-$49 999	6 (24.0%)	7 (21.9%)	
$50 000-$100 000	10 (40.0%)	12 (37.5%)	
Greater than $100 000	2 (8.0%)	11 (34.4%)	

Statistically significant (P<0.05)

Table 4. Association of COVID-19 Vaccine with Flu Shot

Variable	COVID-19 Vaccine No N (%)	COVID-19 Vaccine Yes N (%)	*P* value
Flu shot			
Yes	9 (31.0%)	20 (69.0%)	0.008*
No	2 (5.6%)	34 (99.4%)	

Statistically significant (P<0.05)

Table 5. Association of Teledentistry with Demographics

Variable	Teledentistry No N (%)	Teledentistry Yes N (%)	*P* value
Income (N=57)			
Less than $20 000	4 (44.0%)	5 (56.0%)	0.032*
$20 000-$49 999	5 (39.0%)	8 (61.0%)	
$50 000-$100 000	18 (82.0%)	4 (18.0%)	
Greater than $100 000	10 (77.0%)	3 (23.0%)	
Insurance (N=54)			
Government funded	3 (33.0%)	6 (67.0%)	0.015*
Private	36 (75.0%)	12 (25.0%)	
None	4 (57.0%)	3 (43.0%)	
Race (N=65)			
Black or African American	0 (0.0%)	5 (100%)	0.003*
White	43 (72.9%)	16 (27.1%)	
Unknown	1 (1.0%)	0 (0%)	

* Statistically significant (P<0.05)

DISCUSSION

Among respondents, 81.8% reported they will get the COVID-19 vaccine when it is offered and there was a significant association between having received the flu shot and willingness to also receive the COVID-19 vaccine. However, vaccine hesitancy in Ohio in previously published research differs based on the population. One study reported a high level of COVID-19 vaccine intention and general vaccine acceptance between October 2020 to March 2021.[4] Among the mostly younger sample of study participants with some college or higher educational level, 23.4% of respondents would get the COVID-19 vaccine when it is immediately available and 50.3% would get the vaccine when it has been out for a few months.[4] At the University of Akron, 83% of students, faculty, and staff that were surveyed in 2021 reported they would receive a COVID-19 vaccine at their first opportunity.[5] While a survey of Ohio parents distributed between November 2021 and January 2022 found that 56.5% of parents did not intend to have their children receive a COVID-19 vaccine.[7] A 2022 survey administered to 146 adults in the waiting room of a Spanish-speaking student-run free clinic in Columbus, Ohio, found that over 90% of respondents received a COVID-19 vaccination.[6]

We found that as age increases, the probability of visiting the dentist within 6 months increases. However, we also found a significant association that older participants were more likely to feel at risk at the dental office than younger respondents. Most respondents felt comfortable visiting the dentist during the COVID-19 pandemic (59.1%) and 13.6% reported they will only visit the dentist if they have an emergency/pain, which is consistent with national trends.[18] More than 70% reported having had a dental visit during the pandemic and that safety measures make them feel safe, with 68.2% reporting they feel these safety measures should continue after the pandemic has ended.

Although 93.9% of respondents said they would be willing to fill out health history, dental history forms, and insurance questions electronically instead of doing this in the office, only 31.8% expressed an interest in teledentistry for an online consultation and screening prior to the dental appointment. There was a significant association where higher income individuals, those with private insurance, and Whites were less likely to be interested in teledentistry. This contrasts with another study which found that respondents with higher household incomes and did not live in rural residence were more likely to use teledentistry for the first time because of COVID-19.[25] In the same study, existing users of teledentistry or using teledentistry for the first time were more likely to be younger and have a higher level of education.[25] In our sample, the respondents may have not had an experience with teledentistry in the past which would either make them more or less likely to pursue that as an option. Respondents in our study may not be familiar with the possibilities of teledentistry or preferred in-person interactions at the dental clinic. Teledentistry presents a unique opportunity to provide quality care to patients, including the potential for patients from underserved populations. Our survey sample had private insurance and mostly Whites, so it may not be generalizable to the entire Ohio population or specifically to underserved populations.

One of the strengths of this study was that the survey was administered in a critical time period following the COVID-19 pandemic that allows further understanding of health attitudes and perceptions of dental care. This study adds evidence to the understanding of vaccine hesitancy, intention, and attitudes specific to Ohio, as well as knowledge of teledentistry and dental practice attitudes. Although using the digital data collection strategies via ResearchMatch was a strength of the study to reach people in Ohio, a study limitation was that the study team was not able to follow up with respondents to probe further about variables that may influence respondent attitudes such as dental treatment needs and oral health literacy. Many respondents were willing to fill out health history, dental history forms, and insurance questions electronically, but also the survey in this study was online and our survey did not reach Ohioans without internet access. Self-selection bias and respondent demographics limit generalizability, such as people who lack access to technology may not be able to respond to a survey. These populations may also face barriers in accessing dental care and teledentistry. Because of the cross-sectional design, the study findings only establish correlation and not causation between variables.

PUBLIC HEALTH IMPLICATIONS

The public health implications of this study are relevant to Ohio to understand the attitudes of patients related to dental care, teledentistry, and vaccination. Dental providers, health care providers, and public health professionals should use the results of this study to specifically combat vaccine hesitancy and explore opportunities to utilize teledentistry. Using the results of this study and comparing with previous research, public health initiatives should target flu shot vaccine hesitancy among lower income and older populations. Further research should also examine populations who received the COVID-19 vaccine but did not receive a flu shot, including examining specific barriers with flu and COVID-19 vaccination intention, confidence, and uptake. Dentists in Ohio can use the findings of this study to maintain safe practices to improve patient confidence in dental care, as well as provide dental patients with opportunities to use technology like having patients electronically complete documentation and integrate teledentistry into practice workflow. Teledentistry can be utilized to improve access to care for Ohioans, especially those living in rural communities far from a dental office, and to reduce travel costs and times for patients. Public health initiatives in teledentistry should include raising awareness of teledentistry for patients and providers. Dental providers can educate patients about indications and uses for teledentistry in practice.

CONCLUSIONS

Overall, Ohioans felt comfortable with visiting the dental office following the COVID-19 pandemic. Safety precautions appeared to reduce patient fear of COVID-19 infection in dental settings. There was some hesitancy with receiving a vaccine consistent with the literature, but this presents opportunities to improve patient awareness. Teledentistry and integration of technology in dental practice is a promising avenue to educate patients and provide new opportunities for care.

AUTHOR CONTRIBUTION

David Danesh: conducted literature review, interpreted data, engaged in heavy editing. Taylar Rowe: wrote initial draft, involved in all aspects of the paper. Andy Ai Ni and Wei En Lu: conducted all analyses. Homa Amini, Taylar Rowe, Wei En Lu, Andy Ai Ni: designed and collected survey data. Homa Amini: involved in all aspects of the paper.

REFERENCES

1. Ohio Department of Health. ODH Coronavirus (COVID-19) dashboard. Ohio.gov website. Published 2025. Updated March 27, 2025. Accessed April 26, 2025. [Archived.] https://data.ohio.gov/wps/portal/gov/data/view/archived-covid-19-reporting

2. American Dental Association. ADA urges dentists to heed April 30 interim postponement recommendation, maintain focus on urgent and emergency dental care only [press release]. American Dental Association, Health Policy Institute, April 1, 2020. https://www.ada.org/about/press-releases/2020-archives/summary-of-ada-guidance-during-the-covid-19-crisis

3. Ohio Department of Health. Ohio Department of Health rescinds pandemic health orders Several health orders remain in effect [press release]. Columbus, OH: Ohio Department of Health, June 2, 2021. https://odh.ohio.gov/media-center/odh-news-releases/odh-news-release-06-02-21

4. Mercadante AR, Chen AMH, Chu V, Wong JC, Law AV. Examining general vaccine acceptance and COVID-19 vaccine intention: comparison across pharmacies in California and Ohio. *Pharmacy*. 2023;11(2):46. https://doi.org/10.3390/pharmacy11020046

5. Pellegrino JL, Miller B, Krob J, Darago T. Intention to vaccinate against COVID-19 and potential outreach strategies for a residential research university in Northeastern Ohio. *J Emerg Manag.* 2023;21(7):185-202. https://doi.org/10.5055/jem.0729

6. Scheiber A, Prinster TB, Stecko H, et al. COVID-19 vaccination rates and vaccine hesitancy among Spanish-speaking free clinic patients. *J Community Health*. 2023;48(1):127-135. https://doi.org/10.1007/s10900-022-01150-z

7. Schaumleffel C, Vickers C, Chertok IA. COVID-19 pediatric vaccination attitudes among parents in Ohio. *J Pediatr Health Care*. 2022;36(6):e1-e6. https://doi.org/10.1016/j.pedhc.2022.07.002

8. Patel M, Gokun Y, DeGraffinreid C, et al. COVID-19 vaccination uptake in Ohio: analyzing the difference between metro and non-metro residents. *BMC Public Health*. 2025;25(1):1103. https://doi.org/10.1186/s12889-025-22277-3

9. Bhandari P, Teferra AA, Nau M, et al. COVID-19 vaccine hesitancy by smoking status among Ohio adults. *Ohio J Public Health*. 2024;6(1):1-8. https://doi.org/10.18061/ojph.v6i1.9616

10. Nguyen NT, Boyd LD, Oh U, Vineyard J. Patients' fear, stress, and anxiety toward attending dental visits during the COVID-19 pandemic. *J Dent Hyg*. 2022;96(6):15-23.

11. Kranz AM, Evans LA, Geissler KH. Changes in dental visits and oral health for children by race and ethnicity during the COVID-19 pandemic. *J Am Dent Assoc*. 2024;155(3):195-203.e4. https://doi.org/10.1016/j.adaj.2023.11.005

12. Kranz AM, Chen A, Gahlon G, Stein BD. 2020 trends in dental office visits during the COVID-19 pandemic. *J Am Dent Assoc*. 2021;152(7):535-541.e1. https://doi.org/10.1016/j.adaj.2021.02.016

13. Dickson-Swift V, Kangutkar T, Knevel R, Down S. The impact of COVID-19 on individual oral health: a scoping review. *BMC Oral Health*. 2022;22(1):422. https://doi.org/10.1186/s12903-022-02463-0

14. Dill J, Fontana M, Bader J, Chaffin J, Strock S, Eckert G. Impact of the COVID-19 pandemic on oral health care use in the United States through December 2021. *J Am Dent Assoc*. 2023;154(10):937-947.e3. https://doi.org/10.1016/j.adaj.2023.07.012

15. Wolf TG, Schulze RKW, Ramos-Gomez F, Campus G. Effectiveness of telemedicine and teledentistry after the COVID-19 pandemic. *Int J Environ Res Public Health*. 2022;19(21):13857. https://doi.org/10.3390/ijerph192113857

16. American Dental Association. How COVID-19 is impacting dental practices and patient attitudes toward visiting the dentist [webinar]. American Dental Association, Health Policy Institute. August 2020. Updated August 5, 2020. Accessed April 28, 2025. https://www.ada.org/-/media/project/ada-organization/ada/ada-org/files/resources/research/hpi/hpi_covid_webinar_aug_2020_1.pdf?rev=1d1eac4831134264a9bd4f088172f506&hash=80E6701B3C81C2B4174851630BAE5690

17. American Dental Association. Data for week of September 7th. American Dental Association, Health Policy Institute. The Impact of COVID-19 on the Dental Care Sector Web site. Published 2020. Accessed April 28, 2025. https://www.ada.org/-/media/project/ada-organization/ada/ada-org/files/resources/research/hpi/hpi_covid_webinar_sept_2020_2.pdf?rev=ae6a87e5e19243ac9001062f6353e087&hash=2E0B8DEA71A18BDCA5063258EB58E616

18. American Dental Association. Insights from data from January 2022. American Dental Association, Health Policy Institute. Economic Outlook and Emerging Issues in Dentistry. Published 2022. Accessed April 28, 2025. https://www.ada.org/-/media/project/ada-organization/ada/ada-org/files/resources/research/hpi/jan2022_hpi_economic_outlook_dentistry_slides.pdf?rev=211a33cbe91e4f6e8e61f91e53b009b3&hash=4769CA5831A747FDC040CE4ABC0B0A47

19. Kengne Talla P, Allison P, Bussières A, et al. Teledentistry for improving access to, and quality of oral health care: a protocol for an overview of systematic reviews and meta-analyses. *PLoS One*. 2024;19(1):e0288677. https://doi.org/10.1371/journal.pone.0288677

20. Hammersmith KJ, Thiel MC, Messina MJ, Casamassimo PS, Townsend JA. Connecting medical personnel to dentists via teledentistry in a children's hospital system: a pilot study. *Front Oral Health*. 2021;2:769988. https://doi.org/10.3389/froh.2021.769988

21. Danesh DO, Luca J, Kalady SE, Townsend JA, Hammersmith KJ, Meyer BD. The impact of teledentistry on travel distance and carbon emissions at a children's hospital. *J Am Dent Assoc*. 2025;156(2):144-150. https:/doi.org/10.1016/j.adaj.2024.11.007

22. Murthy V, Herbert C, Bains D, Escudier M, Carey B, Ormond M. Patient experience of virtual consultations in oral medicine during the COVID-19 pandemic. *Oral Dis*. 2022;28 Suppl2:2400-2405. https://doi.org/10.1111/odi.14006

23. Menhadji P, Patel R, Asimakopoulou K, et al. Patients' and dentists' perceptions of tele-dentistry at the time of COVID-19. A questionnaire-based study. *J Dent*. 2021;113:103782. https://doi.org/10.1016/j.jdent.2021.103782

24. Plaza- Ruíz SP, Barbosa-Liz DM, Agudelo-Suárez AA. Impact of COVID-19 on the knowledge and attitudes of dentists toward teledentistry. *JDR Clin Trans Res*. 2021;6(3):268-278. https://doi.org/10.1177/2380084421998632

25. O'Malley E, Surdu S, Langelier M. The impact of pandemic concerns on consumers' teledentistry use during the first months of the COVID-19 pandemic. *Public Health Rep*. 2023;138(1_suppl):63S-71S. https://doi.org/10.1177/00333549221133801

26. Rahman N, Nathwani S, Kandiah T. Teledentistry from a patient perspective during the coronavirus pandemic. *Br Dent J*. Published August 14, 2020. https://doi.org/10.1038/s41415-020-1919-6

27. Harris PA, Scott KW, Lebo L, Hassan N, Lightner C, Pulley J. ResearchMatch: a national registry to recruit volunteers for clinical research. *Acad Med*. 2012;87:66–73. https://doi.org/10.1097/acm.0b013e31823ab7d2

28. R Core Team (2021). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. https://www.R-project.org/