

Mothers' Knowledge, Attitudes, and Fears About Dental Visits During the COVID-19 Pandemic: A Cross-sectional Study

Deema Farsi¹, Nada Farsi²

¹Department of Pediatric Dentistry, ²Department of Dental Public Health, Faculty of Dentistry, King Abdulaziz University, Jeddah, Saudi Arabia

ABSTRACT

Objectives: This study aimed to assess mothers' knowledge of coronavirus disease 2019 and to evaluate their attitudes and fears about dental visits during the pandemic. **Materials and Methods:** A structured questionnaire, developed in English and Arabic, adapted from previous questionnaires was remotely applied to a sample of 833 mothers of children aged 17 years and younger, from different socioeconomic backgrounds. Eligible participants were encouraged to invite others. The questionnaire collected information on knowledge about COVID-19, dental visit patterns, willingness of mothers to take their children to the dentist, and factors affecting it during the pandemic. Frequencies and percentages of categorical variables were presented, and predictors of willingness to visit a dentist during the pandemic were examined by logistic regression. **Results:** Mothers who perceived the dental clinic to be of less or similar danger to public places were more willing to take their children to the dentist during the pandemic than were those who perceived it to be more dangerous (odds ratio [OR] = 2.9, 95% confidence interval [CI]: 1.2–7.0; OR = 2.3, 95% CI: 1.1–4.8, respectively). Mothers who were willing to go to the dentist during the pandemic were more likely to take their children to the dentist compared with mothers who were not willing to go themselves, OR = 16.9 (6.0–47.1). The most commonly reported barrier to visiting the dental clinic was fear of contracting the virus from someone there (80%). Most parents did not take their child to the dentist during the pandemic (83%), and 24% of those who had an appointment did not allow their children to attend. **Conclusion:** Mothers were unlikely to take their children to the dentist except for an emergency and perceived the dental clinic as a risky place for contracting the virus. More reassuring information about infection control measures at dental clinics should be delivered to this population.

KEYWORDS: Barriers, children, COVID-19, dentist, knowledge

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INTRODUCTION

In early 2020, the world witnessed the massive spread of coronavirus disease 2019 (COVID-19), believed to have originated in Wuhan, China.^[1] It is capable of causing severe acute respiratory symptoms, typical signs and symptoms being fever, cough, and fatigue, especially in adults.^[2,3] On March 11, 2020, the World Health Organization (WHO) categorized it as a pandemic.^[4] As of December 1, 2020, the disease

is believed to have affected over 62.66 million people worldwide and has been responsible for the loss of at least 1.46 million lives.^[5] From the evidence available at the time of publication, children do not appear to be at higher risk for COVID-19 than adults, who make

Address for correspondence: Dr. Deema Farsi, Department of Pediatric Dentistry, Faculty of Dentistry, King Abdulaziz University, P.O. Box 80200, Jeddah 21589, Saudi Arabia. E-mail: dfarsi@kau.edu.sa

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up most of the known cases so far.^[6] Nevertheless, undiagnosed children should be regarded as asymptomatic carriers of the disease.^[7]

COVID-19 is caused by a novel coronavirus (2019-nCoV or SARS-CoV-2) that possesses high transmissibility potential.^[1,8] Common transmission routes are direct transmission through cough, sneeze, and droplet inhalation and contact transmission through oral, nasal, and eye mucous membranes.^[9] In addition, 2019-nCoV can be transmitted directly or indirectly through saliva.^[9] Studies have suggested that 2019-nCoV may be airborne through aerosols formed during medical procedures.^[10]

With their unique characteristics, dental settings warrant specific infection control considerations. Dental procedures typically generate aerosols that can contain saliva or blood particles and thus carry the risk of large-scale transmission of the virus.^[11] Although dental clinics typically perform strict infection control measures, even stricter measures have been called for since the beginning of the pandemic.^[7,12,13] In March 2020, most dental practices were encouraged to provide management based on the urgency and acuity of symptoms, while routine care was deferred. As conditions returned to normalcy, more routine care was being provided under the new infection control norms. Detailed and frequently updated guidelines have been published by the Centers for Disease Control and Prevention (CDC), the American Academy of Pediatric Dentistry (AAPD), and the American Dental Association with recommendations to consider prior to the dental visit, at arrival, and during treatment to minimize exposure to the virus and protect staff and patients.^[13,14]

The public has received much information about COVID-19 through social media that could be inaccurate and unnecessarily alarming, potentially leading to confusion and panic. A recent study in China reported that of 1,210 respondents, 53.8% expressed enduring moderate-to-severe psychological impacts from the pandemic.^[15] Given COVID-19's high contagion and fast spread, it is not uncommon for mothers to be alarmed and their attitudes toward dental visits to change. In a recent study by Sun *et al.*, 81% of parents expressed confidence in the clinic; however, 83.78% reported that they would take their child to a dentist only for severe pain.^[16] In a study of 1,003 parents in Brazil, only 18% were willing to take their children to the dental clinic for any procedure, while 67% reported they would take them only for emergencies, and 15% denied dental care altogether.^[17] This is one of the first studies that evaluated parents' knowledge and attitudes regarding dental visits during the pandemic, although

a handful of studies have investigated the impact of COVID-19 on dentists.^[18,19] Thus, the aim of the present study was to assess mothers' knowledge of COVID-19 and to evaluate their attitudes and fears about dental visits during the pandemic.

MATERIALS AND METHODS

POPULATION AND SURVEY

This cross-sectional study targeted mothers of children 17 years and younger in Jeddah, Saudi Arabia. The ethics committee at the Faculty of Dentistry at King Abdulaziz University (KAUFD) approved the study protocol (069-06-20), and the Saudi Center for Disease Prevention and Control approved the study proposal (202007251).

A structured self-administered questionnaire was developed from questionnaires used by Sun *et al.* and Yip *et al.*^[16,20] Questions were added to collect additional relevant information. The questionnaire contained 34 close-ended questions that were divided into six sections (demographic data; COVID-19-related home practices; COVID-19 knowledge; willingness to visit a dentist, attitudes toward visiting a dentist, and barriers to visiting a dentist during the pandemic).

The questionnaire was validated independently by three experts at KAUFD for comprehensibility and objectiveness (a professor in pediatric dentistry, a professor in medical education, an associate professor in dental public health). For face validity, each question was rated for its importance on a five-point scale (1 = very important, 2 = important, 3 = moderately important, 4 = of little importance, and 5 = not important) and whether or not it should be included in the survey on a three-point scale (0 = yes, 1 = no, and 2 = not sure). For content validity, each question was rated in four domains; relevance, clarity, simplicity, and ambiguity on a four-point scale (1 = needs major revision, 2 = needs some revision, 3 = needs minor revision, and 4 = no need for revision).^[21] We considered the development of a bilingual survey essential to cover most of the population of interest. The questionnaire was drafted in English and translated into Arabic; it was then translated back to English and compared with the original in accordance with the well-recognized forward-backward translation technique.^[22] The questionnaire in its English and Arabic forms was piloted with 10 mothers from different socio-economic backgrounds.

The final questionnaire was digitized on an online survey portal, SurveyMonkey (San Mateo, California, USA). A link to the survey was sent via phone as a WhatsApp message to eligible mothers', from different

socioeconomic backgrounds. Snowball sampling methods took place by asking participants to help recruit further participants by sharing the link with eligible mothers in their networks.

The cover page of the survey explained the study's purpose and included the contact information of the principal investigator. The first question was, "Are you a mother of at least one child who is 17 years or younger who resides in Jeddah and consents to participate in this study?" This question was used as consent for participation and to exclude ineligible participants.

To test the validity of the responses and ensure that respondents were reading the questions well and answering accordingly, we added a question halfway through the questionnaire with the following direction: "Please choose the word dentist from the list below." Participants who chose an answer other than "dentist" were excluded from the study. To ensure privacy, the names and contact information of the participants were not recorded, and they were assured that the results were (and will) not be publicly displayed or shared beyond the scope of the study. Furthermore, participation was voluntary, and recipients willingly participated without incentive or pressure.

Data were collected during June 2020. At the end of the data collection period, the data were retrieved for analysis from the collected responses in the online survey software.

STATISTICAL ANALYSES

Frequencies and percentages of categorical variables were presented. Predictors of willingness to visit a dentist during the pandemic were examined by logistic regression, and odds ratios (ORs) and 95% confidence intervals (CIs) were calculated. Willingness to visit a dentist had three response options: no, yes, only for emergency. For ease of interpretation and to allow a sufficient number of participants for statistical analyses, the variable was recategorized into a binary variable: no/only for emergency and yes. Polytomous regression on the three-category variable was run, and results were similar. The predictors assessed were mothers' age, marital status, education level, and occupation; monthly household income, type of dental clinic last visited, perception of danger of dental clinic for 2019-nCoV transmission compared with that in public places; willingness of mothers to go to the dentist themselves during the pandemic; worry about contracting the virus from the dental clinic; and mothers' feelings since the beginning of the pandemic.

A *P*-value of 0.05 was considered statistically significant. Data analyses were conducted with Stata, version 13.0 (StataCorp LP, College Station, Texas, USA).

RESULTS

The link was visited by 2,306 participants, with 1,159 taking the survey. Of these, 324 were excluded because they answered "no" to question 1, and two because they incorrectly answered the validity question. The final sample comprised 833 respondents. Table 1 presents the characteristics of the included respondents. Respondents reported on their COVID-19-related practices at home, 5% of them did not talk to their children about COVID-19, 14% did so when the pandemic first started, and 37% did so only when their children asked, while 23% and 21% spoke to their children about COVID-19 on a weekly and a daily basis, respectively.

The most trusted source of COVID-19 information was the Saudi Ministry of Health (MOH) (68% of respondents), followed by international health entities such as the WHO and the CDC (17% of respondents), then doctors known personally (8%), and news (3%). Doctors in the media and family/friends were the most

Table 1: Characteristics of the study participants

Characteristics	<i>N</i> (%), <i>n</i> = 833
Age (years)	
≤30	107 (12.9)
31–40	442 (53.1)
≥41	284 (34.1)
Nationality	
Saudi	714 (85.7)
Non-Saudi	119 (14.3)
Marital status	
Married	767 (91.1)
Separated	10 (1.2)
Divorced	51 (6.1)
Widowed	5 (0.6)
Education level	
High school or less	65 (7.8)
College/university or diploma	481 (57.7)
Master's degree or higher	287 (34.5)
Occupation	
Housewife	374 (44.9)
Student	13 (1.6)
Non-health care employee	273 (32.8)
Non-dental health care worker	86 (10.3)
Dental health care worker	86 (10.3)
Retired	1 (0.1)
Monthly income (SAR)	
≤3,800	103 (12.4)
3,801 - 38,000	433 (52.0)
>38,000	297 (35.7)
Type of last dental clinic visited by the child	
Never visited a dentist	106 (12.7)
Public	100 (12.0)
Private	627 (75.3)

SAR = Saudi Arabian Riyal (= USD 0.26)

trusted source for 2% of the participants. Regarding feelings of respondents toward COVID-19, 57% felt sometimes anxious and sometimes hopeful since the beginning of the pandemic, 34% felt generally positive, and 9% felt generally anxious and depressed. With regards to parents worry about them or their children contracting the virus from the dental clinic, 26% of the respondents were very worried, 64% were somewhat worried, and 10% were not worried.

Regarding knowledge of COVID-19, 79% of participants believed that cross-infection in the dental clinic occurs by transmission from patient to staff, and 77% that it occurs in the opposite direction, while 62% believed that the infection occurs from patient to patient, and from staff to staff. When participants were asked about which healthcare workers, they believed are at risk of contracting the virus; 85% and 78% reported that nurses and doctors are at risk, respectively, while 70% believed that paramedics are at risk and dentists, followed by other staff (69%). In addition, most respondents reported that the virus can be transmitted even if no fever or symptoms are present (76%), while 4% believed that it can't be transmitted, and 20% did not know. Also, 39% of the respondents believed that dental treatment could cause children to be infected by 2019-nCoV.

Concerning the perception of risk of infection with 2019-nCoV in dental clinics and hospitals/medical clinics compared with that in public places such as malls and parks; 36% of respondents believed that dental clinics were more dangerous than public places. Similarly, 42% believed that hospitals/medical clinics were more dangerous than public places. Perceptions of danger in the dental clinic and hospitals/medical clinics were statistically associated ($P < 0.001$).

Table 2 demonstrates the predictors of willingness to take the child to the dentist during the COVID-19 pandemic. In terms of a perceived barometer for safety to seek dental care, 40% of participants reported that the development of a vaccine would make them feel comfortable taking their children to the dentist during the pandemic, and 39% that a marked decline in daily positive cases in Jeddah would do so. Among the respondents, 6% reported that lifting the curfew would make them feel comfortable taking their child to the dentist; 4% reported that reopening of schools would do so. Only 1% of the mothers reported that nothing would make them feel comfortable taking their child to the dentist; <1% reported that other factors would make them comfortable.

As illustrated in Figure 1, the most common perceived barrier to taking children to the dental clinic was fear

of contracting the virus from someone there. Table 3 demonstrates the attitudes of the mothers regarding taking their children to the dentist during the pandemic, the main reason for dental visits during the pandemic were orthodontic treatment and emergencies (38%). Table 4 presents the importance of the measures taken against COVID-19 in the dental clinics according to the respondents. The majority (82%) reported that dental personnel wearing personal protective equipment (PPE) and the dentist changing gloves frequently were extremely important.

Among the respondents, 54% reported that they would prefer teledentistry over bringing their child to the dental clinic. Most of the respondent's children did not experience teledentistry during the pandemic (93%), but 6% experienced it once, and 1% experienced it more than that.

DISCUSSION

At the dawn of a new decade, the COVID-19 pandemic extended globally, and the first positive case in Saudi Arabia was confirmed on March 2, 2020. The Saudi government undertook rapid measures to contain the spread of the disease, including shutting down schools on March 8 and instituting a nationwide lockdown on March 23.^[23] The lockdown was lifted on June 21; most cities in the country were able to gradually return to normalcy under the new norms (e.g., social distancing, obligatory mask wearing). In the three months of lockdown, people in Saudi Arabia experienced sudden substantial changes to their daily routine and social infrastructure, and many families were negatively affected financially and psychologically. The Saudi MOH disseminated timely educational messages, videos, and brochures on several platforms, including easily accessible social media.

In Saudi Arabia, mothers are usually children's primary caregivers, spending the most time with them and often accompanying them to medical visits. The school shutdown was alarming to many mothers and demonstrated the magnitude of the pandemic. Like most people in the country, mothers in Saudi Arabia are concerned with the pandemic and follow the news regularly. The study targeted this population in particular because mothers would be making most decisions about pediatric dental visits during the pandemic. Recruitment occurred the week before the lockdown lift. The results show that most mothers relied on credible sources of information and that 32% followed COVID-19 news weekly and 62% daily. This is reassuring, as information is more accessible than ever and in such overwhelming volumes that assessment of its validity becomes difficult. Children, too, are exposed

Table 2: Predictors of willingness to take the child to the dentist during the COVID-19 pandemic

	Willingness to take child to the dentist during the pandemic		Univariate OR (95% CI)	Multivariate OR (95% CI)
	No/only for emergency, N = 599	Yes, N = 92		
Age (years)				
<20–30	76 (12.7)	5 (5.4)	1	1
31–40	317 (52.9)	56 (60.9)	2.69 (1.0–6.9)	2.75 (0.9–8.5)
41–>60	206 (34.4)	31 (33.7)	2.29 (0.9–6.1)	2.38 (0.7–7.7)
Marital status				
Married	552 (92.2)	85 (92.4)	1	
Separated/divorced/widowed	47 (7.9)	7 (7.6)	0.97 (0.4–2.2)	
Education level				
High school or less	39 (6.5)	8 (8.7)	1	
College/university or diploma	355 (59.3)	51 (55.4)	0.70 (0.3–1.6)	
Master's degree or higher	205 (34.2)	33 (35.9)	0.78 (0.3–1.8)	
Occupation				
Non-health care employee/student/housewife	473 (79.0)	70 (76.1)	1	
Non-dental health care worker	64 (10.7)	10 (10.9)	1.06 (0.5–2.2)	
Dental health care worker	62 (10.4)	12 (13.0)	1.31 (0.7–2.5)	
Monthly income (SAR)				
≤3,800	71 (11.9)	6 (6.5)	1	
3,801 - 38,000	312 (52.1)	48 (52.2)	1.82 (0.7–4.4)	
>38,000	216 (36.1)	38 (41.3)	2.08 (0.8–5.1)	
Clinic of last dental visit				
Public	72 (12.0)	7 (7.6)	1	
Private	451 (75.3)	82 (89.1)	1.87 (0.8–4.2)	
My child does not go to the dentist	76 (12.7)	3 (3.3)	0.41 (0.1–1.6)	
Perception of danger of dental clinic compared with public places				
More dangerous	236 (39.4)	15 (16.5)	1	1
Similar	273 (45.6)	40 (44.0)	2.31 (1.2–4.3)	2.30 (1.1–4.8)
Less dangerous	90 (15.0)	36 (39.6)	6.29 (3.3–12.0)	2.92 (1.2–7.0)
Willingness of parent to go to the dentist during the pandemic				
No	110 (18.4)	6 (6.5)	1	1
Yes	39 (6.5)	66 (71.7)	31.03 (12.5–77.2)	16.88 (6.0–47.1)
Only for emergency	450 (75.1)	20 (21.7)	0.81 (0.3–2.1)	0.53 (0.2–1.4)
Worry about contracting the virus from the dental clinic				
Very worried	177 (29.6)	7 (7.6)	1	1
Somewhat worried	384 (64.1)	56 (60.9)	3.69 (1.6–8.3)	1.62 (0.6–4.3)
Not worried	38 (6.3)	29 (31.5)	19.30 (7.9–47.3)	2.39 (0.7–8.0)
Mother's feeling since the beginning of COVID-19 pandemic				
Generally anxious and depressed	53 (8.9)	3 (3.3)	1	1
Anxious sometimes, hopeful sometimes	352 (58.8)	48 (52.2)	2.41 (0.7–8.0)	1.76 (0.4–7.3)
Generally positive	194 (32.4)	41 (44.6)	3.73 (1.1–12.5)	1.78 (0.4–7.6)

SAR = Saudi Arabian Riyal (= USD 0.26)

to large volumes of information that may be inaccurate and overly alarming. It is estimated that 1.38 billion children today are out of school, without access to social activities, which may be unsettling for them.^[24] Many families are not only practicing distancing from others, but also from a life that is familiar to them.^[25] In the current study, only 34% of mothers felt positive

most of the time; 48% felt that the pandemic would be a long-term health problem in the country. The preoccupation of parents with the implications of COVID-19 might compromise their ability to sensitively recognize children's distress and respond accordingly.^[26] The absence of emotion-focused, age-appropriate conversations and correction of misinformation might

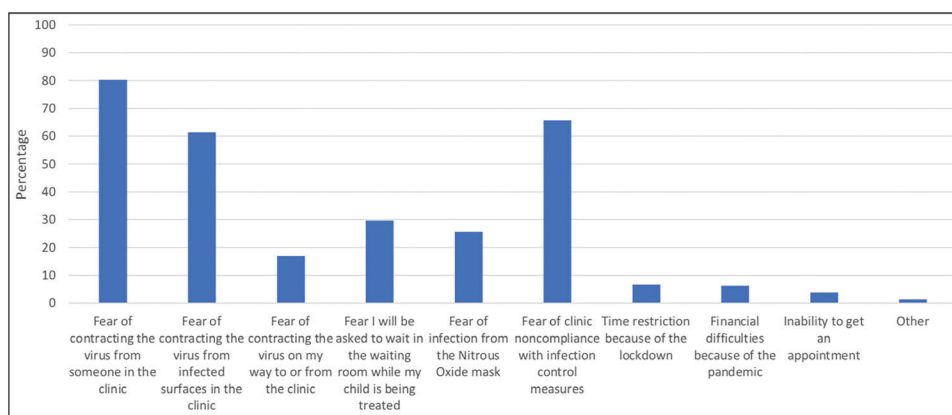


Figure 1: Perceived barriers to taking children to the dental clinic during the COVID-19 pandemic

Table 3: Attitudes regarding taking children to see a dentist during the COVID-19 pandemic

Variable	N (%) [‡] , N = 665
Child taken to dentist since schools closed?	
No	551 (82.9)
Yes	114 (17.1)
Main reason for the visit*	
1st checkup	3 (2.6)
Orthodontic treatment	43 (37.7)
Cleaning	7 (6.1)
Dental treatment	18 (15.8)
Emergency	43 (37.7)
Experience during the visit*	
Comfortable, would take child again	82 (71.9)
Uncomfortable, rather not take the child again	32 (28.1)
Uncomfortable, left the clinic without treatment	0 (0)
Child had dental appointment during the pandemic and did not go	
No	502 (75.7)
Yes	161 (24.3)
Reason for missing the appointment#	
There was a total lockdown	29 (18.0)
Appointment canceled/rescheduled by the clinic	40 (24.8)
Appointment canceled/rescheduled by the parent	91 (56.5)
Other	1 (0.6)

[‡]Some numbers in the cells do not add up to the total number of respondents because of missing values

*Question was only asked to mothers who took their child to the dentist during the pandemic

#Question was only asked to mothers whose children had a dental appointment during the pandemic and did not take them

inadvertently leave children feeling anxious and trying to make sense of the situation on their own.^[27] It was reassuring to know that despite the general anxiety mothers were experiencing, about half of them spoke with their children about the pandemic weekly or daily.

In April 2020, a World Economic Forum publication leveraged infographic data to determine which

occupations face the highest risk of exposure to 2019-nCoV (and thus its spread). The study evaluated three parameters for each occupation studied: contact with others, physical proximity, and exposure to disease and infection. Not surprisingly, dental hygienists, dental assistants, and dentists were three of the top four occupations for the highest COVID-19 risk scores.^[28] The distance that separates the dentist from the working field is only about 35–40 cm; that added to the fact that certain procedures can be time-consuming, especially with an uncooperative child, makes the risk of cross-infection between dentist and patient even higher.^[29] In the current study, almost three times as many mothers believed that dental treatment could cause their children to contract 2019-nCoV as those who did not. A recent report summarized recommendations that minimize contact and droplet virus transmission in the dental setting.^[30] In light of that, and of the AAPD's reemergence practice checklist, participants were asked about their perceived importance of measures taken at dental clinics.^[13] Surprisingly, only 54% felt that “asking COVID-19-related screening questions at the clinic entrance” was extremely important. Moreover, only two-thirds of the mothers felt that “measuring temperature at the clinic entrance” was extremely important. On the other hand, the three highest “extremely important” measures (>80%) were “dentist/assistant wearing PPE,” “dentist changing gloves frequently,” and “dentist washing hands frequently,” suggesting that mothers may be more concerned about contracting the virus from the dental team than from other patients in the clinic.

Despite the high risk of dentistry, few reports are available about 2019-nCoV infection between dental team members and their patients so far. A study on COVID-19 infection in the dental setting reported nine confirmed cases among the dental team in the School and Hospital of Stomatology, Wuhan University, Wuhan, China.^[31] It was suggested in a systematic

Table 4: Importance of measures taken against COVID-19 infection in the dental clinic (n = 649)

Measure	1 (Not important)	2	3	4 (Extremely important)
Measuring temperature at clinic entrance	91 (14.0)	55 (8.5)	75 (11.6)	428 (66.0)
Asking COVID-19-related screening questions at clinic entrance	88 (13.6)	106 (16.3)	104 (16.0)	351 (54.1)
Counters/chairs cleaned between patients	86 (13.3)	17 (2.6)	34 (5.2)	512 (78.9)
Dentist/assistant wearing personal protective equipment	83 (12.8)	14 (2.2)	17 (2.6)	535 (82.4)
Dentist changing gloves frequently	83 (12.8)	13 (2.0)	19 (2.9)	534 (82.3)
Social distancing in waiting rooms	78 (12.0)	29 (4.5)	64 (9.9)	478 (73.7)
Dentist washing hands frequently	83 (12.8)	10 (1.5)	36 (5.6)	520 (80.1)
Asking patient to wash their hands/use sanitizer	80 (12.3)	18 (2.8)	54 (8.3)	497 (76.6)
Staff other than dentist wearing mask	83 (12.8)	22 (3.4)	41 (6.3)	503 (77.5)
Open windows/fresh air in clinic	70 (10.8)	77 (11.9)	129 (19.9)	373 (57.5)
Using disposable dental instruments	85 (13.1)	17 (2.6)	47 (7.2)	500 (77.0)
Providing pretreatment antiseptic mouthwash	89 (13.7)	91 (14.0)	141 (21.7)	328 (50.5)
Mandating all visitors to wear masks when not receiving treatment	89 (13.7)	21 (3.2)	35 (5.4)	504 (77.7)
Changing conventional instruments (handpiece with water spray) to hand instruments	91 (14.0)	89 (13.7)	139 (21.4)	330 (50.9)

review of 9 studies that assessed the transmission of COVID-19 in the dental clinic that there is a potential for transmission, through saliva, bodily fluids, aerosols, contaminated instruments, and surfaces^[32] Nonetheless, one cannot underestimate infection control measures being second nature to most dentists, who routinely wear gloves and a mask, often with eye protection, when treating patients.^[33]

Our study shows that mothers were generally afraid to visit the dentist during the pandemic. Only a minority of them reported that their child had already gone to the dentist during the pandemic. More than one-third viewed dental clinics as being a more dangerous place to contract the virus than public places were. The fear was reflected in their practices as well, as only 13% were willing to take their children to the dentist and the majority stated they would do so for an emergency only (69%). More than half of the mothers preferred teledentistry over visiting the clinic. Sadly, more than half of them had little or no confidence in infection control measures taken at dental clinics: fear of noncompliance with infection control measures was their highest perceived barrier to dental visits, second only to fear of contracting the virus from someone in the clinic. Supporting our findings, Campagnaro *et al.* reported that 86% of children who endured dental trauma during the pandemic did not seek dental care. They also found that parents with higher fear levels and that when the number of COVID-19 cases increases; parents are less likely to take their children to dental appointments.^[17]

The findings demonstrate a logical association between specific predictors and willingness to take the child to the dentist during the COVID-19 pandemic. For example,

mothers who perceived the dental clinic as being of less than or similar danger to public places were more likely to take their children to the dentist than were those who perceived it to be more dangerous. Mothers who were willing to go to the dentist themselves, compared with those who were not, were more likely to take their children to the dentist. Furthermore, mothers who were somewhat or not worried about contracting the virus from the dental clinic were more willing to take their children to the dentist than were those who were very worried; mothers who had been feeling generally positive since the beginning of the pandemic were more willing to take their child to the dentist than were those who felt generally anxious and depressed. In general, mothers over 30 years were more likely to take their children to the dentist during the pandemic than were younger mothers, who may be more protective, have a single child, or have younger children.

Being a dental health care worker (DHCW) did not seem to influence a mother's willingness to take her child to the dentist compared with mothers who were housewives or had other professions. Furthermore, the perceived barriers of DHCW mothers to dental care during the pandemic were similar to those of other mothers. In fact, 90% of DHCW mothers expressed fear that their child may contract the virus from the clinic compared with 79% of other mothers. Surprisingly, 78% of DHCW mothers had concerns regarding noncompliance with infection control measures compared with 64% of other mothers. Lastly, 54% of DHCW mothers versus 34.2% of other mothers perceived the dental clinic to be a more dangerous place to contract the virus than public places. These findings could reflect the fact that for perceived risks to their children, mothers behave instinctively and

similarly regardless of their educational background and knowledge.

One of the major challenges after the pandemic will be dealing with its sequelae. Dental health care has endured changes on many levels. Since the beginning of the pandemic, access to routine dental care has been more limited, as dentists have rightfully taken a backseat to prevent unnecessary risk of infection transmission and to preserve scarce PPE for other professionals who are dealing with COVID-19 patients. Mothers may also have opted not to visit the dentist. In our findings, 57% of mothers whose children had dental appointments canceled or rescheduled them. Furthermore, many mothers were faced with having to support their children with homeschooling while working at home. This not only puts pressure on mothers, but also drastically cut the time available to attend to other duties, such as supervising oral hygiene practices and providing healthy low-sugar meals. These factors may have led to the development of new carious lesions in high-risk children and/or the progression of already established lesions. In light of this, we support phase III (return to normalcy) protocols that urge health care providers to begin prioritizing and reestablishing lost treatment with patients. We also support the strategies implemented to deal with the lineup of patients who have not been seen during the pandemic. Unexpected life events that limit access to dental care, as seen with the COVID-19 pandemic, are a good example of why prevention of oral disease and raising public oral health awareness are of pivotal importance. Dental health care providers should take this opportunity to assess their efforts in public oral health care and must be prepared to play a more active role in the fight against emerging diseases by being readily available for emergency treatment and volunteering as needed in their communities in the fight against COVID-19.

Despite the comprehensiveness of the study, it has limitations. One is the possibility of self-selection bias in the respondents because they participated willingly when they received the link. Furthermore, online recruitment may lead to under- or overrepresentation of the target population because only those who were active on WhatsApp during the period of data collection had the opportunity to participate in the study. Moreover, the survey took an average of 8 min and 23 s to complete, which may have seemed long for some participants, and could explain why there were some incomplete responses. Had the period of data collection been longer, perhaps more participants would have been recruited. However, we felt that continual recruitment after the lockdown lift would result in

biased data that do not reflect the targeted acute phase of the pandemic. Lastly, although the study recruited mothers from different socio-economic and educational backgrounds, they were all from Jeddah, preventing us from generalizing the results on a higher level.

CONCLUSION

In conclusion, most mothers relied on credible sources of information on COVID-19, but not all of them spoke to their children about it. Mothers were concerned about the pandemic and perhaps need to be encouraged to open up to their children to correct any misinformation. This approach would not only be psychologically helpful for mothers, but for children, too. A considerable percentage of mothers, including DHCW mothers, had little confidence in dental infection control measures and perceived the dental clinic as a risky place to contract the virus; they were thus unlikely to take their children to the dentist during the pandemic except for emergencies. More reassuring information about dental infection control measures should be delivered to this population and more efforts directed toward encouraging mothers to resume routine dental care to prevent disease progression.

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CONFLICT OF INTEREST

There are no conflicts of interest to declare.

AUTHORS CONTRIBUTIONS

DF:

- Conceived the ideas
- Drafted the questionnaire
- Collected data
- Composed the manuscript
- Submitted for publication

NF:

- Revised the questionnaire
- Collected data
- Performed statistical analysis
- Revised and approved the manuscript

ETHICAL POLICY AND INSTITUTIONAL REVIEW BOARD STATEMENT

Not applicable.

PATIENT DECLARATION OF CONSENT

Not applicable.

DATA AVAILABILITY STATEMENT

The data set used in the current study is available upon request.

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