

# The impact of parents' fears of the SARS-CoV-2 pandemic on children's visits to pediatric dental offices in Iran

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## ABSTRACT

**Purpose:** This study aimed to investigate the effect of parents' fears of the SARS-CoV-2 pandemic on pediatric dental visits. **Methods:** In this cross-sectional study, conducted from July 2020 to August 2020, 500 parents of children who had visited pediatric dental offices were randomly selected. Parents were given a questionnaire containing 33 questions, which included three parts: (1) demographic characteristics, (2) dental problems scale, and (3) fear of SARS-CoV-2 scale. Based on the collected responses, the relationships between demographic factors, children's dental problems, and parents' fear of SARS-CoV-2 were evaluated. **Results:** The most common reason for visiting a pediatric dentist during the SARS-CoV-2 outbreak was tooth pain. Regarding parents' fear, 62.6% ( $n = 313$ ) had moderate fear, 74.2% ( $n = 371$ ) had a history of delays in referring to the dentist, and 54.4% ( $n = 272$ ) had a history of moderate-to-severe dental pain. The fear scores in mothers were significantly higher than in fathers ( $P < 0.001$ ). Parents of children with more pain and dental problems had higher scores on the fear scale ( $P = 0.017$ ), ( $P = 0.016$ ). **Conclusion:** Most pediatric dental visits during the SARS-CoV-2 outbreak were due to dental pain, and most parents had moderate-to-severe fear of their children being infected by SARS-CoV-2 through dental visits.

**Keywords:** Coronavirus infections, dental care for children, pediatric dentistry, SARS-CoV-2

## Introductions

Coronavirus was first reported in Wuhan, China, in December 2019, and it spread all over the world and became a concerning issue in many countries.<sup>[1]</sup> On 30 January 2020, the World Health Organization (WHO) announced that the progression of a new SARS-CoV-2 (2019-nCoV) was a public health emergency of international concern.<sup>[2]</sup> More than 132,000 cases of COVID-19 from 123 countries and territories were reported to the WHO on 20 March 2020.<sup>[3]</sup> Infectious diseases have become a major threat to global public health in the twenty-first century.<sup>[1]</sup> Iran

is one of the countries that has been significantly affected by SARS-CoV-2; to date, 854,000 infections and 44,802 deaths have occurred due to this disease. At the time of the present study, Iran was experiencing the second wave of the pandemic, with about 2300–2700 new cases and 170–190 deaths recorded daily.<sup>[3]</sup>

Dental patients are at serious risk of contracting SARS-CoV-2 infection via face-to-face contact and exposure to saliva, blood, and other body fluids, as well as through the use of dental instruments. Therefore, dentists play an essential role in preventing the transmission of SARS-CoV-2.<sup>[4]</sup>

Social distancing, wearing masks, washing hands, and avoiding crowded places are the main ways to prevent the disease from spreading; because of that, many patients avoid going to the dentist unless they have had major dental problems and are

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experiencing significant pain. Many elective surgeries and medical and dental treatments have been postponed, and the activities of private medical or dental centers have been altered.<sup>[5]</sup>

When oral and dental emergencies occur, parents and children should visit dental clinics in a timely manner while wearing proper personal protection. During an epidemic, pediatric oral emergencies should be treated according to current guidelines regarding SARS-CoV-2 control.<sup>[6]</sup> Prevalence of emergency pediatric dentistry treatments during the pandemic was greater than that of pre-pandemic and this could be attributed to the lack of their usual oral care providers due to lockdown and government regulations.<sup>[7]</sup>

Moreover, due to the contagious nature and mortality of SARS-CoV-2, many people are naturally concerned about the disease. Unfortunately, fear, anxiety, and depression are consequences of epidemics, and these factors can lead to psychosocial disorders and disturbances in people's lives. Most parents reported the fear of the COVID-19 pandemic that had a high impact on their daily routine during the pandemic.<sup>[8]</sup> Also, fear may prevent people from thinking clearly and rationally when reacting to SARS-CoV-2, which influences their decisions.<sup>[9]</sup>

Considering the broad effects of the SARS-CoV-2 pandemic and its high prevalence in Iran, this study aimed to investigate the parents' reasons for going to the dentist for their children's dental needs and their fear of being infected by SARS-CoV-2 as a result of receiving dental treatment.

## Materials and Methods

This cross-sectional, descriptive study was conducted on 500 parents of children in Ahvaz, Iran, from 11 July to 13 August 2020. A cluster randomized sampling method was employed, and parents of children who sought treatment for dental needs were recruited. The sample size was determined by an  $\alpha$  equal to 95% and a measurable error of 0.5.

Parents who attended pediatric dental offices for their children's dental examinations were asked to answer the questionnaires if they were willing. The inclusion criteria were parents of children up to 12 years old, inhabitants of Ahvaz City in the past two years, and having healthy children without mental or functional disabilities or special health care needs.

A questionnaire was designed by a pediatric dentistry assistant professor to assess the relationship between fear of SARS-CoV-2 infection and participants' characteristics and dental needs. The first part included seven questions about demographic data, children's and parents' age and sex, number of children in the family, educational level, medical history, previous diagnosis of SARS-CoV-2 infection among relatives, chief complaints, history of dental visits since the SARS-CoV-2 outbreak, length of delay in seeking dental treatment, and previous attempts to relieve children's dental problems without a dental examination.

The second part of the questionnaire consisted of six questions about the severity of children's dental problems and their history of pain. For this part of the questionnaire, we borrowed from Jabbarifar's study about oral health-related quality of life among Iranian children, which assessed the severity of children's dental problems.<sup>[10]</sup> Questions in the second part were multiple-choice questions with the following answers and scores: Never = 1; once or twice = 2, sometimes = 3; often = 4; very often = 5; don't know = 1. Higher scores imply more severe dental problems; scores ranged from 5 to 25.

In the third part, parents' fears about SARS-CoV-2 infection were assessed using Ahorsu's fear of SARS-CoV-2 infection scale. This scale was a seven-item questionnaire that was validated in Iran.<sup>[9]</sup> Three questions were added to the questionnaire to evaluate parents' fear about SARS-CoV-2 infection in their children and through dental treatments. The third part of the questionnaire consisted of 10 statements about fear of SARS-CoV-2 infection, with responses given on a 5-point Likert scale. Scores ranged from 10 to 50, with higher scores implying more fear.

Four assistant professors of pediatric dentistry from Ahvaz Jundishapur University assessed the questionnaire's validity. The questionnaire was repeatedly given to 20 patients two weeks apart to assess the reliability of the questionnaire. Cronbach's alpha values for the reliability of the dental problems and fear of SARS-CoV-2 scale questions were 0.79 and 0.88, respectively.

## Ethical considerations

This research was approved by Ahvaz Jundishapur University of Medical Sciences ethics committee, according to the Helsinki Declaration of 1975, as revised in 2000 (Ethical code: IR.AJUMS.REC.1399.534).

## Statistical analysis

Descriptive statistics were used to determine participants' characteristics. The relationship between age and dental problems and fear was evaluated by Pearson's correlation coefficient. The *t*-test was used to calculate the relationship between sex, medical history, SARS-CoV-2 infection in the family, the delay in dental treatment, trying to relieve pain at home, and the number of dental visits. To determine the relationship between fear and sex, the number of children, education and chief complaint, an ANOVA test was used. Data analysis was calculated by the Statistical Package for the Social Sciences (SPSS) software version 20 (SPSS Inc., Armonk, N.Y., USA) and the significance level was set as  $P < 0.05$ .

## Results

Overall, 517 parents were invited to participate in the study; 500 questionnaires were collected. Parents who were unwilling to participate, unable to understand the questions (which were presented in Persian), or did not respond to more than three questions were excluded.

Most of the parents were female and had a bachelor's degree, and the average age of parents was 36.62 years. The average age of children was 5.49 years; there was no difference in sex between children. Most of the participants had one or two children. [Table 1]

The reasons for visiting the dentist were trauma for 5.2% of respondents ( $n = 26$ ), topical fluoride application for prevention for 1.8% ( $n = 9$ ), toothache for 60.2% ( $n = 301$ ),

and tooth infection and swelling of the face for 5.6% ( $n = 28$ ). The numbers of dental visits since the SARS-CoV-2 outbreak were as follows: 74 patients (48.1%) had visited the dentist once, 52 patients (33.8%) had visited twice, 20 patients (13%) had visited three times, 6 patients (3.9%) had visited four times, and two patients (1.3%) had visited five times. Finally, 371 patients (74.2%) had delayed visiting the dentist due to the SARS-CoV-2 outbreak.

As the results demonstrate, the average (and standard deviation) of fear among the study sample, based on the fear of SARS-CoV-2 scale, was  $33.07 \pm 8.08$ . The minimum and maximum values were 10 and 50, respectively. According to the fear of SARS-CoV-2 scores, 10.6% of the participants ( $n = 53$ ) had mild fear, 62.6% ( $n = 313$ ) had moderate fear, and 26.8% ( $n = 134$ ) had severe fear. Fear was significantly correlated with females ( $P < 0.001$ ), lower education ( $P = 0.001$ ), and making a phone call before the dental visit ( $P = 0.011$ ).

There was a significant relationship between patients' chief complaint and scores on the fear of SARS-CoV-2 infection scale. Specifically, among the parents of patients who had been referred because of dental pain and tooth abscesses, the scores on the fear scale were significantly more than among parents of patients with other problems [Table 1].

**Relationships between participants' chief complaints, number of dental visits, history of pain, length of delays in dental visit, the severity of dental problems, and fear of contracting SARS-CoV-2**

Most of the participants had delayed their dental visits, but fear of SARS-CoV-2 scores was not significantly associated with a history of delayed visits ( $P = 0.168$ ) or the length of delay in seeking treatment ( $P = 0.93$ ). The level of the child's dental pain and the severity of their dental problems had a significant effect on fear scores, as parents of children with more pain and more severe dental problems expressed more fear ( $P = 0.017$ ), ( $P = 0.016$ ).

[Table 2, Graph 1].

**Discussion**

This study aimed to evaluate the effect of fear of SARS-CoV-2 on pediatric dental visits in Iran. In this study, we examined patients' fears of SARS-CoV-2 infection through dental visits and delays in pediatric dental treatment despite dental problems. According to the results of our study, fear of SARS-CoV-2 infection was observed in most parents, as 62.6% had moderate fear and another 26.8% had severe fear. Symptoms of severe anxiety such as wet hands, sleep disturbances, and increased heart rate were seen in 14.4%, 18.2%, and 19.6% of parents, respectively.

In some studies, such as the one by Alkhames *et al.* study in Saudi Arabia, the rate of mental problems was lower as only 23.6% of the population experienced moderate-to-severe

**Table 1: Sociodemographic characteristics of participants and relationships between demographic characteristics and fear of SARS-COV-2 infection**

Characteristics	Group	n (%)	P
Respondent to questionnaire	Mother	305 (61)	0.001**
	Father	184 (36.8)	
	Other	11 (2.2)	
Child's gender	Female	248 (49.6)	0.306
	Male	252 (50.4)	
Number of children	1	160 (32)	0.128
	2	241 (48.2)	
	3	83 (16.6)	
	4	16 (3.2)	
Birth order of child	First	282 (56.4)	0.569
	Second	165 (33)	
	Third	45 (9)	
	Fourth	8 (1.6)	
Mother's education	Lower than diploma	37 (7.4)	0.008**
	Diploma	145 (29)	
	Associate	55 (11)	
	Bachelor	206 (41.2)	
	Master and PHD	53 (10.6)	
Father's education	Unreported	4 (0.8)	0.001**
	Lower than diploma	22 (4.4)	
	Diploma	122 (24.4)	
	Associate	39 (7.8)	
	Bachelor	205 (41)	
History of previous disease	Master and PhD	110 (22)	0.325
	Unreported	2 (0.4)	
	Yes	22 (4.4)	
	No	478 (95.6)	
	History of SARS-CoV-2 in relatives	Yes	
First dental visit of child	No	372 (74.4)	0.808
	Yes	205 (41)	
Making a phone call for appointment before visit	No	295 (59)	0.011*
	Yes	381 (67.2)	
Trying to solve the problem without visiting the dentist	No	119 (23.8)	0.334
	Yes	158 (31.6)	
Total sample size		342 (68.4)	
Pearson's correlation coefficient		500 (100)	
Age			
Child's age	500	0.02	0.65
Parent's age	500	0.01	0.869

M=Mean, SD=Standard Deviation, n=number. \* $P < 0.05$

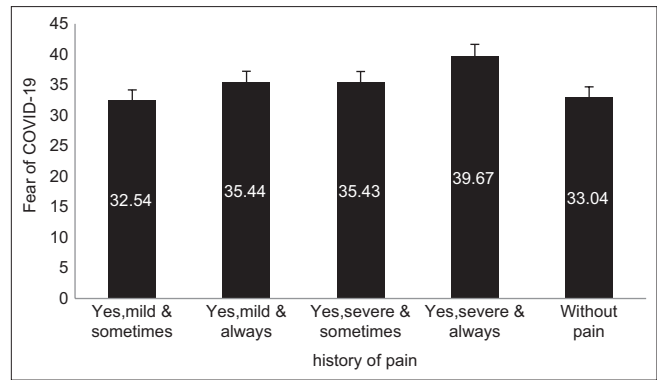
**Table 2: Relationships between participants' chief complaints, number of dental visits, history of pain, amount of delay in dental visit, severity of dental problems and fear of SARS-COV-2 infection**

Variables	Groups	n	M±SD	P
Chief complaint	Trauma	26	29.69±8.74	0.029*
	Fluoride therapy	9	30.78±10.53	
	Pain	301	35.55±7.73	
	Infection and swelling	28	35.71±8.51	
	Other reasons	136	32.26±8.25	
Number of child's dental visits	One	74	32.77±8.51	0.149
	More than one time	52	30.87±7.63	
Delay in visiting dentist	Yes	371	33.36±7.89	0.168
	No	129	32.22±8.33	
Length of delay	One month and less	139	34.29±7.84	0.093
	More than one month	232	32.84±8.09	
Dental problems score	Mild	5-11	0.011	0.016*
	Moderate	12-18		
	severe	19-35		
	Mean	12.56±3.87		

M=Mean, SD=Standard Deviation, n=number. \*P<0.05

psychological effects due to the SARS-CoV-2 outbreak.<sup>[11]</sup> Also, in studies by Gao *et al.* and Wang *et al.* in China, 22.6% and 26.4% of respondents, respectively, had anxiety problems.<sup>[12,13]</sup> In line with our results, in Najjar *et al.*'s study in Saudi Arabia, 57.5% of respondents had moderate-to-severe anxiety.<sup>[14]</sup> In Moghanibashi's study in Iran, 40.4% of participants expressed having moderate-to-severe anxiety.<sup>[15]</sup> In Mazza *et al.*'s study in Italy, 88.5% of participants had severe-to-moderate anxiety, and 78% had severe stress.<sup>[16]</sup> These differences in results may be caused by the different times in which the studies were performed: for example, several studies were conducted when social lockdowns were not in effect in those countries, while other studies were conducted after people had been forced to stay at home.<sup>[8,9,15,16]</sup> At the time of our study, the Khuzestan province was in a state of emergency, and the second wave of SARS-CoV-2 had already occurred,<sup>[17]</sup> which could have increased our participants' fear. Also, younger people—specifically in the age range of 21–40 years—showed more fear of SARS-CoV-2 infection than older individuals.<sup>[14,15]</sup> The average age of parents in our study was 36.62, which could also be a reason for the high fear. People's previous histories of attendance in medical centers can also affect their fear of SARS-CoV-2 infection,<sup>[15,18]</sup> meaning that the location of our research in a dental office could have affected the results.

One of the aims of our study was to evaluate how long people delayed the dental treatment of their children due to the fear of SARS-CoV-2. Such delays were seen in 74.2% of participants, and 62.5% of them had postponed dental visits for more than one month. Samara *et al.* analyzed the effect of COVID-19 pandemic on the hospital admissions for dental infections. They noted that during the pandemic period, more than one-third of



**Graph 1: Parents' fear based on history of pain.** ANOVA results showed that there was a significant difference between the average scores of fear based on pain history ( $P = 0.029$ ). The results of least significant differences (LSD) *post hoc* test showed that the average fear of COVID-19 in individuals who had severe pain was significantly higher than individuals who had mild and sometimes and had no pain ( $P < 0.05$ ). Also, the average fear in individuals who had high and sometimes pain was significantly higher than in individuals who had low and sometimes pain ( $P = 0.017$ )

the patients who were admitted with severe dental infections had already contacted their dentists for antibiotic prescription.<sup>[19]</sup> Samuel *et al.*'s study demonstrated that there was a significant increase in the demand for emergency treatments, such as tooth extractions, which could be attributed to the parents' fear of going to a dental appointment and unmet dental needs which led to tooth extraction because of delay in visiting dentists.<sup>[7]</sup> Consistent with the results of our study, other studies reported that the majority of patients with a history of chronic diseases avoided going to medical centers for further treatment due to fear of SARS-CoV-2 infection.<sup>[20,21]</sup> In our study, most parents mentioned their children's dental pain, tooth abscesses, and cellulitis. In line with our study, Simpson *et al.* reported that 49% of dental treatments during the pandemic led to tooth extraction.<sup>[22]</sup> In Gao *et al.*'s study in China, most referrals were due to tooth infection and swelling, and a significant change was seen in the reason for referral of patients after the outbreak of SARS-CoV-2; the rate of dental infections also increased significantly.<sup>[23]</sup> Also, in Madi *et al.*'s study, the proportion of emergency dental visits during the pandemic was significantly higher than that during the pre-pandemic period, and during the pandemic period, acute dental pain consisted of 100% of all emergency visits.<sup>[24]</sup> Consistent with our results, in Fux-Noy *et al.*'s study, during lockdown, most of the children were diagnosed with dentoalveolar abscess (32.3%), compared to 14% and 21% during the previous or subsequent periods, respectively.<sup>[25]</sup>

Therefore, the SARS-CoV-2 pandemic significantly affected dental referrals in pediatric dentistry patients and caused delays in managing dental problems, which led to more complicated treatments and severe dental problems.

Moreover, in our study, only 5.2% of patients had been referred because of tooth trauma, which, similar to the results presented



by Simpson *et al.*<sup>[22]</sup> and Vishal *et al.*,<sup>[26]</sup> showed a reduction in referrals due to dental trauma. It is likely that children's activities decreased because of the closure of schools and sports clubs, and so the risk of dental trauma decreased.

In our study, the fear of SARS-CoV-2 infection was higher in women, which corroborated with other studies.<sup>[19,20,23,24]</sup> However, other demographic characteristics such as the number of children, the birth order of the child, and sex were not related to the parents' fears, which could be due to the number of one or two children in the majority of families.

Based on our results, the majority of parents did not try to reduce their child's pain at home without going to the dentist or by calling the office. Also, there was no significant relationship between parents' fears and these questions, indicating the need for further education of parents to solve non-emergency problems through phone calls. Teledentistry is a helpful method and its use can provide patient's education, treatment planning and patient follow-up with telephone consultations. Teledentistry reduces the need for face-to-face contact with patients in this situation. Thus, more emphasis should be placed on telephone triage for patients.<sup>[27]</sup>

In our study, 25.6% of participants had a history of SARS-CoV-2 disease in their families, which is more than other studies. Also, there was no significant relationship between the history of infection and fear, which is similar to the results of Alkhames *et al.*'s study.<sup>[11]</sup> Contrarily, in Moghanibashi *et al.*'s study in Iran, 19% of respondents had a history of SARS-CoV-2 among their relatives, and a significant relationship was observed between the history of SARS-CoV-2 in relatives and fear.<sup>[15]</sup>

Parents of patients with more severe dental problems and more dental pain also had more fear, implying that delays in dental treatment were due to fear of SARS-CoV-2 infection. This issue was seen in other studies regarding the treatment of patients with cancer and systemic diseases.<sup>[11,18,20]</sup> Similarly, patients' non-attendance due to fear of SARS-CoV-2 led to a decrease in non-emergency referrals of children to medical centers.<sup>[28]</sup>

Although reducing unnecessary referrals reduces the risk of developing SARS-CoV-2, the failure to diagnose some problems early can lead to more severe diseases in the future. Therefore, it is necessary to inform patients about situations that need early treatment. Untreated severe dental issues can lead to abscesses and cellulitis, which might require hospitalization or the extraction of teeth, thereby causing future problems. Consequently, the development of more severe dental problems and widespread dental needs is an indirect result of the SARS-CoV-2 pandemic, and dental professionals should be aware of modifications in dental needs during and after this period. Besides, preventive recommendations about healthy diets and oral health care are recommended to reduce the need for dental treatments during the pandemic.

## Limitations

The present study is unique as there are no documented studies in scientific literature that assessed parents' delay in dentistry referrals because of fear of the SARS-CoV-2 pandemic. One of the limitations of this study is that it was a cross-sectional study, and the prevalence of SARS-CoV-2 at different times may affect parents' attitudes and fears. This study was also performed on people who had attended the dental offices; those who had not yet been referred after several months despite toothaches were not included. According to the results of the present study, the SARS-CoV-2 pandemic has many effects on children's dental treatments, and many parents are afraid of contracting this disease through dental visits, which shows the effects of the SARS-CoV-2 outbreak on all aspects of patients' lives and health.

## Conclusions

This study shows the problems facing children's dental health during the SARS-CoV-2 pandemic. Most pediatric dental visits during the pandemic have been due to dental pain. There was a moderate-to-severe fear of contracting SARS-CoV-2 through dental visits in the majority of parents. Delays in dental treatment were reported in most parents despite their children's pain. During the SARS-CoV-2 pandemic, some children may suffer from dental problems because of their parents' fear of infection.

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## Conflicts of interest

There are no conflicts of interest.

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