

Reasons for applying to pediatric dental clinics during coronavirus disease 2019 pandemic

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Original Article

Abstract

BACKGROUND AND AIM: The coronavirus disease 2019 (COVID-19) pandemic has caused changes in both patient profile and dental services due to the high risk of COVID-19 transmission in dental clinics. This study aimed to investigate the effect of the COVID-19 pandemic on the reasons for applying to the pediatric dental clinics.

METHODS: During the COVID-19 pandemic, a questionnaire was given to the parents of systemically healthy children aged 1-14 years who applied to the paedodontics clinics for oral examinations. The families were asked about their sociodemographic status, reasons for the application, and their opinions about the pandemic. The obtained data were analyzed using chi-square, Kruskal-Wallis, Spearman's rank correlation, and binary logistic regression analysis tests.

RESULTS: While the most common reason for presentation was toothache (49.8%), the percentage of the patients who applied to the Pediatric Dental Clinic, School of Dentistry, İnönü University, Malatya, Turkey, with urgent reasons was 58.2%. There was an increase in the urgent application in children with low income and younger children ($P < 0.010$). A negative correlation was found between the urgent applications and income level ($r = -0.100$, $P = 0.014$).

CONCLUSION: In the COVID-19 and similar outbreaks that may occur in the future, it is of great importance for pediatric dentists to be able to effectively manage urgent applications in children to protect public health and reduce contamination.

KEYWORDS: COVID-19; COVID-19 Pandemic; Emergencies; Dental; Pediatric Dentistry

Citation: Duruk G, Serme M, Akkuc S. **Reasons for applying to pediatric dental clinics during coronavirus disease 2019 pandemic.** J Oral Health Oral Epidemiol 2021; Special Issue of COVID-19 (4): 31-42.

In December 2019, a cluster of pneumonia cases with an unknown reason were detected in China.¹

Based on the studies on genomes obtained from patients, it was determined that the agent was included in the coronavirus family.² The Coronaviridae Study Group (CSG) of the International Committee on Taxonomy of Viruses has acknowledged that this pathogen, temporarily named 2019-new coronavirus (nCoV), is from the same family as Severe Acute Respiratory Syndrome-Coronavirus (SARS-CoV) and has been named SARS-CoV-2.³ Due to the highly transmissible disease named coronavirus disease 2019 (COVID-19), which emerged in China and spread to other countries in the world, a global pandemic was declared by

the World Health Organization (WHO) on March 11, 2020.⁴

Contamination of coronaviruses occurs through direct or indirect contact with infected droplets from the mucosa.⁵ The aerosol formed during dental treatment in clinics remains suspended in the air for a long time. Many bacteria and viruses found in the oral flora are also included in this aerosol.⁶ The isolation of the SARS-CoV-2 virus from saliva is an indicator of how high the risk of transmission in dental clinics is.⁷

A chart published in the New York Times on March 15, 2020 shows that dentists are at the highest risk of coronavirus among all healthcare professionals.⁸ The WHO and the United States Centers for Disease Control and Prevention (CDC) have recommended the

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use of personal protective equipment (PPE), such as gowns, gloves, N95 mask, air-purifying respirator, and face shield or goggles, to prevent transmissions and infections in healthcare workers.^{9,10}

Since the SARS-CoV-2 S protein attaches angiotensin-converting enzyme 2 (ACE2) and this enzyme is less developed at a younger age, less severe cases of the COVID-19 infection have been reported in children and/or adolescents compared to adults. Hence, it has milder symptoms and a good prognosis.¹¹ Nevertheless, scientific studies confirm that children of all ages can be infected with coronavirus and transmit it to others, and also, the spread of the virus can become critical in the presence of super-spreaders.¹² In order to contain SARS-CoV-2 during the pandemic, pediatric dentists were recommended to take all necessary PPE precautions in clinics, perform only emergency dental treatments in accordance with the instructions, and not to perform the other procedures.^{13,14} In Turkey, as in many countries, dental clinic services were limited due to the high risk of transmission and only emergency treatments were provided during this period.¹⁵

It is important to know the reasons for the applications to the pediatric dental clinics in order to protect the public health from future outbreaks and guide pediatric dentists to take measures. Therefore, this study aimed to investigate the effect of the COVID-19 pandemic on the reasons for the application to the pediatric dental clinics and the awareness of families about the virus transmission in pediatric dental clinics.

The null hypothesis (H_0) of this study is that (i) the sociodemographic status will not have an effect on the reasons for referral of children who apply to paedodontics clinic during the pandemic, and (ii) more than half of the applications (approximately 60%) will be due to toothache.

Methods

In this study, a self-administered

questionnaire was created about the reasons why children consult with a dentist during the pandemic. First of all, a literature search was done in Turkish and English using the keywords "COVID-19 pandemic", "pediatric dental clinic", "pediatric dentistry", "dental visit", "dental application", "urgent application", and "children". Then, a questionnaire was compiled from relevant sources. The questionnaire was sent to four pediatric dentists and one biostatistician to examine the adequacy of the questionnaire. Based on the expert opinion, necessary changes were made, such as adding and removing some items. Next, the final questionnaire was tested by three pediatric dentists to see if the questions were within an understandable and conceptual framework. Finally, the questionnaire was sent to a Turkish language expert for the language validity, and was completed at this stage.

A pilot study involving 20 children and their parents who did not participate in the main study was conducted to test the suitability of the methodology, which revealed no need to change the proposed methods (Cronbach's alpha: 0.93; $\alpha > 0.90$ indicates excellent internal consistency).

According to the power analysis based on the H_0 hypothesis, it was estimated that approximately 60% of the applications to the paedodontics clinics during the pandemic would be related to toothache, considering type I error (alpha) of 0.05, power (1-beta) of 0.8, and effect size of 0.55. For this study, it was calculated that at least, 50 patients had to apply with a toothache and the questionnaire had to be applied to the parents of at least 100 patients in total for this study.

Ethical approval was obtained from the Ethics Committee of İnönü University, Malatya, Turkey, in accordance with all the procedures performed in studies involving human participants, the ethical standards of the institutional and/or national research committee, and the Declaration of Helsinki version 2000 (Ethical code: 2020/92). The written informed consent was obtained from

the parents before the examination. This study was conducted at the School of Dentistry, Department of Pedodontics, İnönü University, which serves as a tertiary public healthcare institution. Six hundred pediatric patients (302 girls, 298 boys) and their parents (335 mothers, 265 fathers), all volunteers, participated in this study. A self-administered questionnaire was applied to the parents of systemically healthy children aged 1-14 years who came to the Pediatric Dental Clinic, School of Dentistry, İnönü University, to be examined during the COVID-19 outbreak from June 1, 2020 to December 31, 2020.

The questionnaire consists of 3 parts. In the first part, there were questions about the sociodemographic status of the children and parents (13 questions) and the opinions of the parents about COVID-19. In the second part (3 questions) and the third part, the questions were about the reason why the children applied to the paedodontics clinic (11 questions) and about whether the children used any medication when they had a toothache during the pandemic (1 question). The self-administered questionnaire was filled out by the parents.

3 of the 11 complaints submitted in the third section were accepted as the urgent application (UA). The other 8 complaints were determined as the non-urgent application (NUA). Each complaint was scored as 1, while no complaint was scored as 0, and then, the total complaint score of each patient was calculated by summing the given scores. The patients were divided into two groups as urgent group and non-urgent group, according to their reasons of the application with dental complaints. The patients admitted to the emergency room with at least one complaint were included in the UA group, while the others were included in the NUA group.

The obtained data were analyzed using SPSS software (version 22, IBM Corporation, Armonk, NY, USA). Cronbach's alpha was used to assess the internal consistency of the questionnaire.

Proportions were compared by chi-square and Fisher's exact tests. The data were first

analyzed for the normal distribution using Kolmogorov-Smirnov and Shapiro-Wilk tests, and as a results, the data were analyzed using non-parametric tests. Spearman's rank correlation test was used to determine the relationship between the income and the urgent applications. The Kruskal-Wallis test was used for the statistical comparison of the median values of the urgent application score in terms of the sociodemographic variables that were significant according to the chi-square test. Binary logistic regression analysis was used to estimate the relative parameters of the urgent applications to the paedodontics clinic. Statistical significance level was considered at $P < 0.05$.

Results

Approximately 1800 pediatric patients applied to the Pediatric Dental Clinic, School of Dentistry, İnönü University for oral examinations within 7 months. Six hundred of them agreed to participate in the survey (participation rate: 33%).

The mean age of the children was 8.35 ± 3.00 years (age range: 1 to 14). Table 1 presents the reasons for the children to apply to the paedodontics clinic. The most common reason for the application was toothache (49.8%). The percentage of the patients with urgent dental conditions was 58.2%. When asked what they did to relieve the pain before coming to the clinic, 72 (24.1%) out of 299 patients with toothache stated that they came right after they developed a toothache. 175 (58.5%) of them stated that first, they took some medication to relieve the pain, but when the pain persisted, they decided to come to the clinic and 52 (17.4%) subjects stated that they expected the pain to pass, and they came when it did not.

The distribution of the answers given to the questions about the sociodemographic information of the children and their parents and the parents' opinions about the COVID-19 pandemic, as well as the statistical analysis results of these parameters are presented in table 2.

Table 1. The distribution of the reasons for applying to the pediatric dental clinic, and mean, standard deviation (SD), and median (minimum-maximum) values of the dental problems

Group	Dental complaints	Values		Score of dental complaints		
		n (%)	n (%)	Range	Mean \pm SD	Median (minimum-maximum)
UA	Dental pain	299 (49.8)				
	Abscess	55 (9.2)	349 (58.2)	0 to 3	0.63 \pm 0.58	1 (0-2)
	Trauma	26 (4.3)				
	Oral/lip lesions	6 (1.0)				
	Control	90 (15.0)				
NUA	Dental stain	10 (1.7)				
	Tooth decay	213 (35.5)	251 (41.8)	0 to 8	0.77 \pm 0.66	1 (0-4)
	Orthodontic treatment	67 (11.2)				
	Mobility of tooth	32 (5.3)				
	Bruxism	12 (2.0)				
	Other reasons	29 (4.8)				
Total		600 (100)	600 (100)	0 to 11	1.40 \pm 0.66	1 (1-5)

UA: Urgent application; NUA: Non-urgent application; SD: Standard deviation

When the percentages of the urgent applications and the non-urgent applications were compared statistically according to the 16 questions in table 2, it was observed that the children's age, income, and maternal education level had a statistically significant effect on the reason why they applied to the clinic with an emergency dental complaint.

The number of patients with urgent applications decreased as the income level increased. A negative correlation was found between these two parameters ($r = -0.100$, $P = 0.014$). The average age of the children who applied to the paedodontics clinic due to urgent cases was lower than that of those with non-urgent cases ($P < 0.001$). The mean \pm standard deviation (SD), median (minimum-maximum) values of the urgent application score according to the income level and maternal education level, and the results of comparative evaluation are presented in table 3.

According to the logistic regression model, the estimation power of 16 parameters specified in table 4 on urgent applications was 12% ($P = 0.018$). The children whose maternal education level was master degree were 0.19 times (< 1) more likely to make urgent applications than those whose maternal education level was primary school degree. It was also found that the families with a monthly income of $\text{₺}4000\text{-}6000$ made urgent application 0.48 times (< 1)

more than those with a monthly income of $\text{₺}1000\text{-}2400$. Urgent applications were 1.63 times higher among children who reached the School of Dentistry by private vehicles. The estimation power of the logistic regression model was 80.5% in urgent applications, 40.2% in non-urgent applications, and 63.7% in overall applications.

Discussion

The COVID-19 pandemic has made it necessary to make serious changes in routine dental services all over the world due to the high risk of transmission with droplets/aerosols generated during dental procedures. The first officially known case of COVID-19 in Turkey was detected on March 10, 2020. About 2 weeks later, patient admissions were suspended in the Pediatric Dental Clinic, School of Dentistry, Inonu University and quarantines across the country began. After having taken the necessary precautions in the school according to the CDC's recommendations,¹⁰ the patient admissions resumed from June 1, 2020, which is considered as the beginning of the transition to the normalization process from coronavirus pandemic in the whole country. This study was conducted on children and their parents who had applied to the Department of Pediatric Dentistry, Inonu University, over a period of 7 months from June 1, 2020 to December 31, 2020.

Table 2. The distribution of the personal data and the answers to the questions about parents' perspectives on the coronavirus disease 2019 (COVID-19) pandemic, and statistical analyses of the urgency of the application according to these parameters

Sociodemographic variables		UA	NUA	P
For children (2 questions)				
Age (year) (mean \pm SD)	8.35 \pm 3.00	7.93 \pm 3.10	8.94 \pm 2.75	0.001**
	n (%)	n (%)***	n (%)***	
Sex				0.215*
Female	302 (50.3)	168 (48.1)	134 (53.4)	
Male	298 (49.7)	181 (51.9)	117 (46.6)	
For parents (7 questions)				
Parent completing the questionnaire				
Mother	335 (55.8)	204 (58.5)	131 (52.2)	0.075*
Father	265 (44.2)	145 (41.5)	120 (47.8)	
Maternal education				
Primary school	175 (29.2)	103 (29.5)	72 (28.7)	0.027*#
Secondary school	110 (18.3)	66 (18.9)	44 (17.5)	
High school	183 (30.5)	116 (33.2)	67 (26.7)	
University	114 (19.0)	59 (16.9)	55 (21.9)	
Master	18 (3.0)	5 (1.4)	13 (5.2)	
Paternal education				
Primary school	104 (17.3)	61 (17.5)	43 (17.1)	0.258*
Secondary school	111 (18.5)	67 (19.2)	44 (17.5)	
High school	213 (35.5)	133 (38.1)	80 (31.9)	
University	129 (21.5)	66 (18.9)	63 (25.1)	
Master	43 (7.2)	22 (6.3)	21 (8.4)	
Education level of the parents completing the questionnaire				
Primary school	133 (22.2)	80 (22.9)	53 (21.1)	0.429*
Secondary school	97 (16.2)	57 (16.3)	40 (15.9)	
High school	203 (33.8)	123 (35.2)	80 (31.9)	
University	135 (22.5)	75 (21.5)	60 (23.9)	
Master	32 (5.3)	14 (4.0)	18 (7.2)	
Maternal age (year)				
20-30	85 (14.2)	57 (16.3)	28 (11.2)	0.316*
31-40	376 (62.7)	216 (61.9)	160 (63.7)	
41-50	128 (21.3)	70 (20.1)	58 (23.1)	
> 50	11 (1.8)	6 (1.7)	5 (2.0)	
Paternal age (year)				
20-30	44 (7.3)	31 (8.9)	13 (5.2)	0.094*
31-40	345 (57.5)	207 (59.3)	138 (55.0)	
41-50	182 (30.3)	94 (26.9)	88 (35.1)	
> 50	29 (4.8)	17 (4.9)	12 (4.8)	
Age of the parents completing the questionnaire (year)				
20-30	57 (9.5)	39 (11.2)	18 (7.2)	0.299*
31-40	365 (60.8)	215 (61.6)	150 (59.8)	
41-50	160 (26.7)	86 (24.6)	74 (29.5)	
> 50	18 (3.0)	9 (2.6)	9 (3.6)	
For family (4 questions)				
Place of residence				
City center	530 (88.3)	308 (88.3)	222 (88.4)	> 0.999*
Suburb	70 (11.7)	41 (11.7)	29 (11.6)	
Means of transport				
Public transport vehicles	221 (36.8)	121 (34.7)	100 (39.8)	0.199*
Private vehicle	379 (63.2)	228 (65.3)	151 (60.2)	
Monthly income (₺)				
1000-2400	230 (38.3)	140 (40.1)	90 (35.9)	0.004*#
2500-4000	203 (33.8)	131 (37.5)	72 (28.7)	
4000-6000	99 (16.5)	46 (13.2)	53 (21.1)	
> 6000	68 (11.3)	32 (9.2)	36 (14.3)	

Table 2. The distribution of the personal data and the answers to the questions about parents' perspectives on the coronavirus disease 2019 (COVID-19) pandemic, and statistical analyses of the urgency of the application according to these parameters (continue)

	n (%)	UA [n (%)]	NUA [n (%)]	P
Application date to the pediatric dental clinic				
June-July-August	250 (41.7)	142 (40.7)	108 (43.0)	0.838*
September-October	150 (25.0)	88 (25.2)	62 (24.7)	
November-December	200 (33.3)	119 (34.1)	81 (32.3)	
About COVID-19 (3 questions)				
Are you worried about the possibility of coronavirus transmission?				
Yes	430 (71.7)	249 (71.3)	181 (72.1)	0.855*
No	170 (28.3)	100 (28.7)	70 (27.9)	
Are you taking measures to reduce the risk of coronavirus transmission?				
Yes	595 (99.2)	346 (99.1)	249 (99.2)	> 0.999*
No	5 (0.8)	3 (0.9)	2 (0.8)	
How much is the risk of coronavirus transmission in pediatric dental clinics?				
Low	149 (24.8)	81 (23.2)	68 (27.1)	0.432*
Middle	181 (30.2)	111 (31.8)	70 (27.9)	
High	93 (15.5)	50 (14.3)	43 (17.1)	
No idea	177 (29.5)	107 (30.7)	70 (27.9)	

*Chi-square test; **Independent samples t-test; ***Column percentage; #Denote statistical significance at the $P < 0.05$ level
SD: Standard deviation; COVID-19: Coronavirus disease 2019

In our previous study investigating the measures taken by Turkish dentists at the beginning of the pandemic (March 16-20, 2020), the insufficiency of the measures taken and the uneasiness of the physicians were emphasized.¹⁶ However, with the increase of the knowledge and awareness of both physicians and institutions about the COVID-19, the measures in dental clinics were also increased to the highest levels. On March 31, 2020, the guideline crafted by the American Dental Association (ADA) for dentists to determine the urgent need of their patients during the COVID-19 outbreak was updated.¹⁷ According to this guideline, the conditions such as severe toothache caused by pulpitis, abscess or localized bacterial infection resulting in localized pain and swelling, alveolar osteitis, pericoronitis and third molar toothache, a tooth fracture that causes pain or soft tissue trauma, avulsion/luxation as a result of dental trauma, necessary dental treatments before critical medical procedures, and surgical post-operative dressing change were considered as emergency dental complaints.¹⁷ The Turkish Dental Association (TDA) also has created an algorithm for emergency triage in dental clinics, similar to the CDC's recommendations for physicians to apply.¹⁰

In this study, with the recommendations of CDC, ADA, and TDA, severe toothache caused by pulp inflammation, abscess resulting in localized pain and swelling, and dental traumas were considered as urgent applications. The reason why the patients who applied for mouth and lip wounds were not considered within the scope of "the urgent application" is that the complaints of these patients were found to be aphthae in the oral examination. Of the six patients, three patients who applied to the clinic with this complaint were also found to have another issue requiring urgent intervention. On the other hand, one patient applied to the clinic with the complaint of shaking teeth and 2 patients with aphthae.

In a study conducted during the pandemic, it was revealed that the overall number of patients decreased, but the number of emergency patients increased.¹⁸ While the percentage of the cases requiring emergency treatment was 36.8% (33.6% dental pain, 3.2% dental trauma) in the previous study conducted in the clinic to investigate the reasons for children to apply to the paedodontics clinic between January 2020 and February 2020 before the pandemic,¹⁹ this percentage increased to 58.2% during the pandemic.

Table 3. The mean, standard deviation (SD), and median (minimum-maximum) values of the urgency of the application according to the maternal education level and income

Sociodemographic variables	The score of dental complaints									
	UA					NUA				
	n (%)	Mean ± SD	Median (min-max)	Test statistics	P	n (%)	Mean ± SD	Median (min-max)	Test statistics	P
Maternal education										
Primary school	103 (29.5)	0.65 ± 0.59	1 (0-2) ^{*¥}	$\chi^2 = 11.681$	0.020 [#]	72 (28.7)	0.77 ± 0.67	1 (0-3)	$\chi^2 = 8.483$	0.075
Secondary school	66 (18.9)	0.65 ± 0.57	1 (0-2) ^{*¥}			44 (17.5)	0.78 ± 0.63	1 (0-3)		
High school	116 (33.2)	0.70 ± 0.59	1 (0-2) [*]			67 (26.7)	0.68 ± 0.66	1 (0-4)		
University	59 (16.9)	0.55 ± 0.57	1 (0-2) ^{*¥}			55 (21.9)	0.85 ± 0.68	1 (0-4)		
Master	5 (1.4)	0.28 ± 0.46	0 (0-1) [¥]			13 (5.2)	0.94 ± 0.54	1 (0-2)		
Monthly income (₺)										
1000-2400	140 (40.1)	0.68 ± 0.61	1 (0-2) [*]	$\chi^2 = 14.070$	0.003 [#]	90 (35.9)	0.79 ± 0.69	1 (0-4) ^{*¥}	$\chi^2 = 12.110$	0.007 [#]
2500-4000	131 (37.5)	0.70 ± 0.56	1 (0-2) [*]			72 (28.7)	0.66 ± 0.61	1 (0-3) [*]		
4000-6000	46 (13.2)	0.49 ± 0.54	0 (0-2) [¥]			53 (21.1)	0.82 ± 0.66	1 (0-4) ^{*¥}		
> 6000	32 (9.2)	0.50 ± 0.56	0 (0-2) ^{*¥}			36 (14.3)	0.94 ± 0.66	1 (0-2) [¥]		

χ^2 : Kruskal-Wallis test statistic; ^{*¥}There is no statistically significant difference between the same symbols; [#]Denote statistical significance at the P < 0.05 level
SD: Standard deviation

Table 4. The estimation power on the urgent applications of the independent variables in the logistic regression model

Variable	OR (β)	95% CI	P
Age	0.896	0.842-0.954	0.001#
Sex			
Female	1		
Male	1.159	0.814-1.650	0.413
Parents completing the questionnaire			
Mother	1		
Father	0.708	0.454-1.106	0.129
Maternal education level			0.107
Primary school	1		
Secondary school	1.065	0.468-2.424	0.880
High school	1.114	0.514-2.414	0.785
University	0.516	0.200-1.332	0.172
Master	0.186	0.037-0.937	0.042#
Paternal education level			0.725
Primary school	1		
Secondary school	1.239	0.542-2.833	0.612
High school	1.393	0.593-3.274	0.446
University	0.762	0.226-2.575	0.662
Master	1.263	0.325-4.904	0.736
Education level of the parents completing the questionnaire			0.364
Primary school	1		
Secondary school	0.671	0.224-2.009	0.475
High school	0.674	0.231-1.972	0.472
University	1.951	0.475-8.006	0.354
Master	1.446	0.230-9.110	0.694
Maternal age (year)			0.932
20-30	1		
31-40	0.908	0.377-2.188	0.829
41-50	1.169	0.343-3.989	0.803
> 50	1.199	0.105-13.622	0.884
Paternal age (year)			0.468
20-30	1		
31-40	0.752	0.187-3.029	0.688
41-50	0.453	0.092-2.224	0.329
> 50	0.947	0.146-6.134	0.955
Age of the parents completing the questionnaire (year)			0.907
20-30	1		
31-40	1.244	0.276-5.611	0.776
41-50	1.499	0.227-9.889	0.674
> 50	0.789	0.051-12.169	0.865
Place of residence			
City center	1		
Suburb	0.902	0.515-1.580	0.718
Means of transport			
Public transport vehicles	1		
Private vehicle	1.629	1.080-2.457	0.020#
Monthly income (₺)			
1000-2400	1		
2500-4000	1.132	0.722-1.774	0.589
4000-6000	0.479	0.248-0.925	0.028#
> 6000	0.755	0.346-1.649	0.481
Application date to the pediatric dental clinic			0.878
June-July-August	1		
September-October	1.091	0.704-1.691	0.697
November-December	1.102	0.729-1.666	0.646

Table 4. The estimation power on the urgent applications of the independent variables in the logistic regression model (continue)

Variable	OR (β)	95% CI	P
Are you worried about the possibility of coronavirus transmission?			
Yes	1.008	0.671-1.513	0.971
No	1		
Are you taking measures to reduce the risk of coronavirus transmission?			
Yes	0.949	0.129-6.974	0.959
No	1		
How much is the risk of coronavirus transmission in pediatric dental clinics?			0.331
Low	1		
Middle	1.360	0.837-2.210	0.214
High	0.835	0.462-1.508	0.549
No idea	1.052	0.645-1.714	0.840
Model summary	-2 log likelihood	Cox and Snell R ²	Nagelkerke R ²
	759.657	0.089	0.120

Dependent variable: Urgent application (0: No; 1: Yes); #Denote statistical significance at the P < 0.05 level

OR: Odds ratio; CI: Confidence interval; SD: Standard deviation

In another study conducted in Beijing, China, it was reported that the number of applications to dental clinics in the same period of the previous year decreased sharply compared to that during the pandemic.²⁰ In a study conducted in Wuhan, China, when the number and proportions of the patients who applied to an endodontics clinic in 2018, 2019, and 2020 were examined, it was observed that there was a serious decrease in the number of patients in 2020 compared to that in the previous years, but there was an increase in the proportion of the urgent applications.²¹

While the percentage of the patients with dental trauma was 3.2% in our previous study,¹⁹ this percentage increased to 4.3% in this study. In the study conducted by Kamalova et al., it was reported that the percentage of the patients with dental trauma decreased,²² and this result may be related to the ban of outdoor games, sports training, and competitions for children during the COVID-19 pandemic when social distancing is required. In addition, similar to the study of Yang et al.,²³ in this study, the reason for the increase of the percentage of referrals to the pediatric dental clinics due to dental trauma may be home accidents, because children have been spending most of the day at home during the pandemic.

Toothache is often the reason for urgent

applications in pediatric dental clinics. In children, toothache occurs for many reasons and negatively affects children's quality of life.²⁴ In this study, 49.8% of the patients applied to our clinic for the pain in the pandemic. More than half of these patients (58.5%) had already used medication to relieve the pain before coming to the clinic, but their pain did not go away. It is thought that the reason why parents first tried to control the toothache in their children by using medication may be because they were worried about the COVID-19 transmission in dental clinics.

Authorities warned the people about avoiding public environments and not going out unnecessarily in order to reduce the COVID-19 transmission according to the CDC's recommendations.¹⁰ However, there were patients who applied to our clinic in the pandemic even though they did not need the urgent dental care despite the high risk of the COVID-19 transmission.⁶ Only 15.5% of the parents stated that the risk of the COVID-19 transmission was high when asked about their opinions on this issue. Other parents either were not worried (55.0%) or had no idea about the risk of transmission (29.5%). This is thought to be due to parents' trust in the measures taken by hospitals against the risk of COVID-19 transmission. In the study of Yang et al., online interviews with parents

were conducted during the COVID-19 pandemic. Some parents stated that they were concerned about the passage of time for the feasibility of orthodontic treatment. In this study, 11.2% of the patients applied for orthodontic treatment. The reason why these patients applied to the clinic, despite being non-urgent, is thought to be due to aesthetic anxiety and the concern that the treatment time has passed.²³

In the present study, as the income level decreased, the number of emergency patients increased and this negative relationship was found to be statistically significant ($P = 0.004$). Our clinic is the only place that provides public dental services for children in the region and families with high socioeconomic status (SES) usually prefer private dental clinics. Families with low SES are less likely to have access to dental services and oral care equipment. There are studies that have found that children coming from families with low SES have more oral and dental health issues than others.²⁵ In this study, similar to the previous studies in the literature, the families with low SES applied to our dental clinic mostly due to the complaints requiring urgent intervention during the COVID-19 pandemic. In addition, the urgent applications were 1.63 times higher among children who reached the School of Dentistry by private vehicles. Because, it was easier to reach the school by private vehicles than by public transport vehicles.

The significant relationship between the urgent applications to the paedodontics clinic and the children's age was one of the remarkable aspects of this study. Since private pediatric dental clinics do not adequately intervene in non-cooperative and young children, they usually direct these children to the pediatric dentists. In addition, the frequency and duration of tooth brushing is observed less in younger children and their brushing habits are less adequate compared to older children, because their motor skills are not sufficiently developed.²⁶ In this study, the reason why younger patients, on average,

apply to the emergency room is due to the inadequacy of oral health behaviors in young children and the need for specialist physicians during treatments. It was found that the level of maternal education with the lowest median value of urgent application was master's degree ($P = 0.027$). However, the percentage of the mothers with master degree was only 3%. The statistical difference can be due to this proportional distribution.

In terms of the reasons why the patients applied to the clinic, there was no difference between the summer months when the number of COVID-19 cases decreased and the autumn and winter months when the number of COVID-19 cases increased. This is an indication that patients tend to go to the clinic in cases of dental complaints, and toothache is at the top of the pain scale.

In this study, the admission reasons were recorded from the parents' perspective. However, based on our previous study, in emergency situations such as toothache and dental trauma, the accuracy rate in determining the parents' complaints that require emergency intervention is generally close to the accuracy rate in the diagnosis of pediatric dentists.¹⁹

One of the limitations of this study is that the Decayed, Missing, and Filled Teeth (DMFT) scores were not recorded. However, in this study, rather than investigating the children's oral health, the reasons for the admission to the paedodontics clinic during the pandemic were investigated. In addition, there were two more limitations in this study: (i) it is not stated whether the main reason for presenting the patients with pain was pulpal or periapical, (ii) the type of dental trauma was not detailed. To the best of our knowledge, this is the first study in the literature that compared the reasons why parents applied to the paedodontics clinic for their children according to the sociodemographic factors during the COVID-19 pandemic, which shows the strength of the study. This study also provided information on the reasons why

pediatric patients apply to the paedodontics clinics during the COVID-19 pandemic and emphasized the need to take measures for patient management in future outbreaks.

Conclusion

The COVID-19 pandemic has caused changes in both the applicant patient profile and dental services due to the high risk of transmission in dental clinics. In this study, as age and income level decreased, the percentage of admission due to the urgent complaints increased. During the pandemic, the most common reason for application was toothache. Although the need for emergency intervention for dental complaints is not observed, parents still prefer to apply to pediatric dental clinics despite the risk of COVID-19 transmission.

Since the postponement of the non-urgent dental care during an outbreak will prevent

the spread of the epidemic to a wider population, parents should be educated about this issue. Pediatric dentists should advise the pediatric patients and parents on oral hygiene, so as to keep the dental problems from getting worse due to the postponed dental treatments. Further comprehensive studies on the subject are needed.

Conflict of Interests

Authors have no conflict of interest.

Acknowledgments

The authors received no financial support for the research. The authors wish to thank all participants for their valuable contribution to this study. Moreover, the authors express their deepest gratitude to all the healthcare professionals who contributed to the fight against COVID-19.

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