



The Impact of COVID-19 Outbreak on the Pediatric Dentists and the Pediatric Dental Practice Across Turkey

Türkiye’de COVID-19 Pandemisinin Çocuk Diş Hekimleri ve Çocuk Diş Hekimliği Uygulamaları Üzerindeki Etkisi

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Abstract

Objective: The coronavirus disease-2019 (COVID-19) pandemic has had a significant impact on pediatric dentists and the clinical practice of pediatric dentistry. The aim of this study was to investigate the effect of the COVID-19 pandemic among pediatric dentists in Turkey by evaluating protective measures, attitudes, and perception levels regarding COVID-19, clinical protocols, and professional approaches of pediatric dental practitioners.

Materials and Methods: A descriptive cross-sectional survey was conducted on a sample of pediatric dentists in Turkey. The questionnaire consisted of 34 questions in five domains: personal data, health conditions, precautionary measures and working conditions, knowledge and self-perceived risk of infection, attitudes and perception, and COVID-19 pandemic impact on clinical practice.

Results: A total of 221 pediatric dentists participated in the survey. 33.9% of the participants (n=75) perform non-emergency procedures during the pandemic. Almost half of the participants considered atraumatic restorative treatment option for teeth with dentin caries (n=120, 54.3%). Moreover, the participants reported that they would treat a traumatized tooth [a tooth with luxation (n=210, 95%)].

Conclusion: Pediatric dentists can limit their dental procedures to emergency treatments and select biological, noninvasive, or minimally invasive methods to reduce the risk of COVID-19 transmission.

Keywords: COVID-19, dental practice, infection control, pediatric dentistry

Öz

Amaç: Koronavirüs hastalığı-2019 (COVID-19) pandemisinin çocuk diş hekimleri ve çocuk diş hekimliği klinik uygulamaları üzerinde önemli bir etkisi olmuştur. Bu çalışmanın amacı, çocuk diş hekimlerinin COVID-19 ile ilgili aldıkları koruyucu önlemleri, tutum ve algı düzeylerini, klinik uygulamalarını ve profesyonel yaklaşımlarını değerlendirerek, Türkiye’deki çocuk diş hekimleri arasında COVID-19 pandemisinin etkisini araştırmaktır.

Gereç ve Yöntemler: Türkiye’deki çocuk diş hekimlerinin bir bölümüne tanımlayıcı, kesitsel bir anket gönderildi. Anket beş alanı kapsayan 34 sorudan oluşmaktadır: kişisel veriler, sağlık durumları, koruyucu önlemler ve çalışma koşulları, bilgi ve algılanan enfeksiyon riski, tutum ve algı düzeyleri ve COVID-19 pandemisinin klinik uygulamalar üzerindeki etkisi.

Bulgular: Araştırmaya toplam 221 çocuk diş hekimi katıldı. Katılımcıların %33,9’u (n=75) pandemi döneminde, acil olmayan tedavileri uygulamaktadır. Katılımcıların neredeyse yarısı dentin çürüğü olan dişler için atravmatik restoratif tedavi seçeneğini tercih etmektedir (n=120, %54,3). Ayrıca, katılımcılar travmatize olmuş bir dişi [luksasyonlu bir dişi (n=210, %95)] tedavi edeceklerini bildirdi.

Sonuç: Çocuk diş hekimleri, diş tedavilerini acil tedavilerle sınırlayabilir ve COVID-19 bulaşma riskini azaltmak için biyolojik, invazif olmayan veya minimal invaziv yöntemler seçebilirler.

Anahtar Kelimeler: COVID-19, diş hekimliği uygulamaları, enfeksiyon kontrolü, çocuk dişhekimliği

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Introduction

The coronavirus disease-2019 (COVID-19) outbreak is a public health crisis for which diagnostic and treatment efforts present challenges for the healthcare communities all around the world (1). As the world fights the COVID-19 pandemic, dentists have had to alter routine clinical actions. The nature of dental procedures that can create an aerosol cloud makes dental work environments among the highest risk categories for COVID-19 transmission (2). As such, routine dental care was suspended to help reduce transmission of infection during the COVID-19 outbreak (3).

Pediatric dentists who treat children in the pandemic must implement universal infection control implementations at the highest level. As opportunities to encourage preventive dental practice have emerged in this pandemic situation, they must be seized. Moreover, contemporary, minimally invasive procedures that lessen or wipe out aerosol generation must be used during the pandemic (4). When using restorative or endodontic treatment, chemomechanical caries removal e.g., Carisolv and papain gel is a suitable alternatives (5,6). Additionally, silver diamine fluoride and glass ionomer cements can be preferred (6). In some cases, analgesics and/or antibiotics may be considered as therapeutic agents (6).

It is widely accepted that standard personal protective equipment (PPE) is not sufficient for airborne infections (e.g., COVID-19). With this in mind, some more effective measures can be taken. Protective equipment e.g., safety glasses, mask, glove, face shield, and protective outerwear to create a barrier against the virus is highly recommended to dentists because transmission of airborne droplet infection is mentioned as the main spread route in dental practice (5). However, considering that all PPE that must be worn as recommended in all general guidelines are also valid for pediatric dentists, wearing all of this equipment at the same time helps create a dental anxiety-enhancing situation, especially for children in the younger age group. In addition to the possibility of increasing anxiety in the pediatric patient as a result of wearing PPE, another situation experienced is the difficulty of verbal communication. This situation may cause an increase in dental treatments under sedation and general anesthesia in children during the pandemic period.

Pediatric dentistry aims to protect children's well-being and safety by redesigning, reassessing and reflecting dental care and treatment practices during the pandemic, staying up to date with existing evidence-based guidance and recommendations for child oral health care. Therefore, a risk assessment of the application must be conducted to minimize the risk of COVID-19 transmission and to determine the necessary precautions. The purpose of this study was to assess the knowledge, thoughts and behaviors of pediatric dentists about the measures to be taken against COVID-19 disease caused by the severe acute respiratory syndrome coronavirus-2 as they actively carry out their duties. It is also the intention to evaluate the effects of the

COVID-19 outbreak on clinical practice in pediatric dentistry as well as to raise awareness on the importance of these changes.

Materials and Methods

This study was based on a questionnaire applied between November 3 and December 3, 2020, among Turkish pediatric dentists including those doing post-graduation studies, working in government, private and other health sectors. The total number of pediatric dentists in Turkey was estimated to be about 1,500 in total, including the ones who work in public, private, and nonprofit organizations. Based on simple random sampling method, the minimum number of participants needed for the study was found as 211. A questionnaire was designed with guidance from the relevant sources and based on experts' opinions (attending pediatric dentists). Ethical permission required for the study to be carried out was obtained from Gaziosmanpaşa Training and Research Hospital, Medical Research Local Ethics Board (number: 179, date: 21.10.2020); and 221 individuals who responded to the survey were included.

For this study, Google forms was used to create the survey. Before starting the study, in order to test the comprehensibility and consistency of the questionnaire within the scope of the study, the questions were sent to 3 specialists, 2 pediatric dentists and 1 biostatistician. With their guidance, biased and confusing questions were omitted. The questionnaire consisted of six domains and included 46 questions. The domains included in the questionnaire were personal characteristics (age, gender, working status), health status (symptoms of the COVID-19), precautionary measures and working conditions, knowledge and self-perceived infection risk, attitudes and perception and COVID-19 pandemic impact on clinical practice. A brief introduction was presented at the beginning of the survey to inform the respondents of the purpose and content of this study, and electronic informed consent was obtained if they agreed to complete the questionnaire. The dentists were asked to participate in the study online (e-mails/social media) and to distribute the survey to colleagues. A total of volunteering 221 Turkish pediatric dentists answered the survey.

Statistical Analysis

All data were transferred from Google forms into Microsoft Excel (Microsoft Corp, Redmond, WA) and analyzed with IBM SPSS Statistics 22 (SPSS IBM, Turkey). The suitability of the parameters to the normal distribution was evaluated by Kolmogorov-Smirnov and Shapiro-Wilks tests, and it was found that the parameters did not show a normal distribution. To evaluate the data, descriptive statistical methods (mean scores, SD, frequencies), and Kruskal-Wallis test were used in the comparison of more than two groups of parameters in comparison of quantitative data and Dunn's test was used to determine the group that caused the difference. Mann-Whitney U test was used to compare parameters between

groups. To compare qualitative data, chi-square test, Fisher's exact chi-square test, and Fisher-Freeman-Halton test were used. Significance was assessed at the $p < 0.05$ level for this study.

Results

Overall, 221 pediatric dentists filled the questionnaire. Among all the participants, 38 (17.2%) were male, and 183 (82.8%) were female. The average age was 31.66 ± 7.88 years. 52.5% of the participants work in a state university, 17.6% in a private dental polyclinic, 13.1% in a foundation university,

8.1% in a private dental office, 5.4% in a government oral-dental health center, and 3.2% in a private dental hospital.

The distribution of the participants' answers given to questions about dental practices which were done during the pandemic is presented in Table 1. 57.9% of the participants stated that there was no change in the number of patients who wanted to be treated with sedation or general anesthesia when compared with the pre-pandemic period, while 28.5% of the participants stated that the number of patients who wanted to be treated with sedation or general anesthesia increased and 13.6% of the participants stated that there was a decrease in this respect.

Table 1. Distribution of answers given to questions about dental practices which were done during pandemic

Questions	Options	n	%
Treatment option considered for the treatment of a deciduous tooth with acute pulpitis	Root canal treatment	107	48.4
	Tooth extraction	90	40.7
	Giving antibiotics and follow up	68	30.8
The treatment option considered for enamel caries	Atraumatic restorative treatment	85	38.5
	Pit and fissure sealant	72	32.6
	Treatment with chemomechanical caries removal agents	22	10
	Conservative treatment	102	46.2
The treatment option considered for teeth with dentin caries	Atraumatic restorative treatment	120	54.3
	Pit and fissure sealant	7	3.2
	Treatment with chemomechanical caries removal agents	28	12.7
	Caries sealing technique	50	22.6
	Conservative treatment	140	63.3
	Hall technique	41	18.6
Application of hall technique	Yes	40	18.1
	No	173	78.3
	I don't know this technique	8	3.6
The use of topical silver diamine fluoride application	Yes	32	14.5
	No	181	81.9
	I don't know this technique	8	3.6
During the pandemic, treatment of a tooth with enamel-dentin fracture as a result of trauma	Yes	193	87.3
	No	28	12.7
During the pandemic, treatment of a tooth avulsed as a result of trauma	Yes	207	93.7
	No	14	6.3
During the pandemic, treatment a tooth with luxation as a result of trauma	Yes	210	95.0
	No	11	5.0
The preferred imaging method when the patient wants to make a radiographic diagnosis of a single tooth in the first examination	Intraoral imaging	124	56.1
	Extraoral imaging	97	43.9

Table 1. Continued

Questions	Options	n	%
Continuing to work as before the COVID-19 pandemic	Yes	58	26.2
	No	163	73.8
Emergency patients only	Yes	75	33.9
	No	142	64.3
	I do not accept any patients	4	1.8
Knowing the definition of emergency patient in paediatric dentistry	Yes	215	97.3
	No	6	2.7
COVID-19: Coronavirus disease-2019			

Precautions were taken by dentists continuing to work in the pandemic. PPE and devices used by pediatric dentists are presented in Table 2.

A statistically significant difference was detected between the rates of only taking care of dental emergency patients according to institution ($p=0.000$; $p<0.05$). In governmental oral and dental health centers and in state universities, the rates of treating only emergency patients (66.7%, 49.1%) are significantly higher than it is in private dental offices (5.6%), private dental polyclinic (7.7%) and foundation universities (13.8%) ($p_1=0.001$; $p_2=0.001$; $p_3=0.002$; $p<0.05$). There is no significant difference between other institutions ($p>0.05$).

The treatment modalities applied by dentists during the pandemic period also changed according to the institution they work in (Table 3).

Discussion

While 64.3% of the pediatric dentists treated all of the pediatric dental patients, 33.9% only cared for dental emergency patients. Unlike, in the studies by Bekes et al. (7) and Ahmadi et al. (8), the majority of the participants (respectively 78.6%, 70%) refrained from performing non-

emergency procedures while the pandemic continues. This suggests that dental practice must be performed with more infection control measures and non-emergency treatments must be delayed until the pandemic is over (9).

For patients suffering from severe toothache and intense caries, pathogenic tooth extraction may be considered instead of a restorative treatment because this may shorten the treatment time and reduce infection risk (10). In case of emergency, the American Dental Association COVID-19 Dental Emergency document (10) suggests that chemomechanical caries removal and handpieces must be preferred to rotary systems. In symptomatic irreversible pulpitis, pain reduction with pulpotomy and pulpectomy is recommended over conventional root canal treatments, if possible (11). In this study, the percentage of tooth extraction option considered for the treatment of a deciduous tooth with acute pulpitis is 40.7%, while conventional root canal treatment option is 48.4%. 54.3% of the participants considered atraumatic restorative treatment option for teeth with dentin caries. Only 12.7% of the participants considered treatment with chemomechanical caries removal agents for teeth with dentin caries.

During the pandemic, the percentages of treatment option for a tooth with enamel-dentin fracture, the treatment option

Table 2. Answers to questions about personal protective equipment, devices and aerosol

		n	%
Personal protective equipment	Surgical mask	199	90.0
	Filtering facepiece 2 or filtering facepiece 3 masks	214	96.8
	Disposable headset	139	62.9
	Sterile microfiber disposable gown	174	78.7
	Disposable gown	173	78.3
	Safety glasses or visor	152	68.8
	Sterile disposable gloves	68	30.8
	Disposable gloves	215	97.3
	Rotating instrument with anti-retraction valve	14	6.3

Table 3. Evaluations of clinical practices during COVID-19 pandemic according to the institution being worked at

		Private dental office	Private dental polyclinic	Private dental hospital	State university	Foundation university	Governmental oral and dental health center	
		n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	p-value
Treatment option in the treatment of a deciduous tooth with acute pulpitis	Root canal treatment	15 (83.3%)	22 (56.4%)	4 (57.1%)	45 (38.8%)	17 (58.6%)	4 (33.3%)	² 0.005*
	Tooth extraction	2 (11.1%)	9 (23.1%)	3 (42.9%)	63 (54.3%)	10 (34.5%)	3 (25%)	¹ 0.000*
	Giving antibiotics and follow up	3 (16.7%)	13 (33.3%)	3 (42.9%)	31 (26.7%)	9 (31%)	9 (75%)	¹ 0.014*
Treatment option for a tooth with enamel caries	Atraumatic restorative treatment	1 (5.6%)	7 (17.9%)	5 (71.4%)	57 (49.1%)	9 (31%)	6 (50%)	¹ 0.000*
	Pit and fissure sealant	6 (33.3%)	10 (25.6%)	2 (28.6%)	41 (35.3%)	11 (37.9%)	2 (16.7%)	¹ 0.715
	Treatment with chemomechanical caries removal agents	0 (0%)	3 (7.7%)	0 (0%)	17 (14.7%)	1 (3.4%)	1 (8.3%)	¹ 0.291
	Conservative treatment	13 (72.2%)	22 (56.4%)	3 (42.9%)	46 (39.7%)	17 (58.6%)	1 (8.3%)	² 0.004*
Treatment option for a tooth with dentin caries	Atraumatic restorative treatment	1 (5.6%)	10 (25.6%)	5 (71.4%)	78 (67.2%)	14 (48.3%)	12 (100%)	² 0.000*
	Pit and fissure sealant	0 (0%)	0 (0%)	0 (0%)	6 (5.2%)	1 (3.4%)	0 (0%)	² 0.734
	Treatment with chemomechanical caries removal agents	0 (0%)	5 (12.8%)	0 (0%)	16 (13.8%)	4 (13.8%)	3 (25%)	¹ 0.364
	Caries sealing technique	0 (0%)	6 (15.4%)	0 (0%)	33 (28.4%)	4 (13.8%)	7 (58.3%)	¹ 0.001*
	Conservative treatment	17 (94.4%)	30 (76.9%)	3 (42.9%)	61 (52.6%)	26 (89.7%)	3 (25%)	¹ 0.000*
	Hall technique	0 (0%)	3 (7.7%)	3 (42.9%)	26 (22.4%)	7 (24.1%)	2 (16.7%)	¹ 0.021*
Applying the hall technique	Yes	1 (5.6%)	3 (7.7%)	3 (42.9%)	26 (22.4%)	7 (24.1%)	0 (0%)	² 0.013*
	No	15 (83.3%)	34 (87.2%)	4 (57.1%)	88 (75.9%)	22 (75.9%)	10 (83.3%)	
	I don't know this technique	2 (11.1%)	2 (5.1%)	0 (0%)	2 (1.7%)	0 (0%)	2 (16.7%)	
The use of topical silver diamine fluoride application	Yes	3 (16.7%)	4 (10.3%)	1 (14.3%)	20 (17.2%)	4 (13.8%)	0 (0%)	² 0.150
	No	12 (66.7%)	34 (87.2%)	6 (85.7%)	92 (79.3%)	25 (86.2%)	12 (100%)	
	I don't know this technique	3 (16.7%)	1 (2.6%)	0 (0%)	4 (3.4%)	0 (0%)	0 (0%)	

¹Fisher-Freeman-Halton test, ²Chi-square test, *p<0.05, COVID-19: Coronavirus-2019

of a tooth avulsed, and the treatment option for a tooth with luxation as a result of trauma were 87.3%, 93.7%, 95% respectively, which means that pediatric dentists care about trauma treatment.

Wearing filtering facepiece 2 or filtering facepiece 3 masks was among the most frequent (96.8%) measure. Duruk et al. (12) indicated that wearing an N95 mask was one of the measures taken at least by 12.36% of Turkish dentists. That study was published at the beginning of the pandemic so this low rate may be related to the difficulties of finding an N95 mask in the early days of the pandemic.

The rate of applying for root-canal treatment in private dental offices (83.3%) is significantly higher than those in private dental polyclinics (56.4%), state universities (38.8%) and governmental oral and dental health centers (33.3%) ($p_1=0.048$; $p_2=0.001$; $p_3=0.009$; $p<0.05$). Moreover, the rate of applying for conservative treatment in private dental offices (72.2%) is significantly higher than in state universities (39.7%) ($p=0.010$; $p<0.05$). Although it was reported by Ahmadi et al. (8) that 86% of dental professionals will emphasize preventive care, not perform unneeded treatment and cut back on the treatment sessions as much as they can in the future, urgent dental cases need treatment, and dentists must adopt strict infection control measures and use minimally invasive methods, and avoid equipment generating aerosol (13).

It is seen that the rate of applying for tooth extraction in the treatment of a deciduous tooth with acute pulpitis at state universities (54.3%) is significantly higher than in private dental offices (11.1%) and private dental polyclinics (23.1%) ($p_1=0.001$; $p_2=0.001$; $p<0.05$). There is a statistically significant difference between the administration of antibiotics and follow-up rates in the treatment of a primary tooth with acute pulpitis according to the type of institution ($p=0.000$; $p<0.05$). The rate of giving antibiotics and follow up in governmental oral and dental health centers (75%) is significantly higher than in private dental offices (16.7%), private dental polyclinics (33.3%), state universities (26.7%) and foundation universities (31%) ($p_1=0.002$; $p_2=0.011$; $p_3=0.001$; $p_4=0.010$; $p<0.05$). It was discovered that caries sealing technique and the hall technique, both of which are minimally invasive techniques, in the treatment of a tooth with dentin caries has not been used in any of the private dental offices.

All in all, during the COVID-19 pandemic, there has been some restrictions on non-emergency dental care. In this respect, reopening dental practices will probably present some unique challenges and will certainly provide opportunities to have more focus on prevention and procedures that are nonaerosol-generating.

This study aims to contribute to the literature by raising awareness among pediatric dentists about infection control measures, prevention and non-aerosol-generating procedures.

Conclusion

Since the symptoms of the COVID-19 disease are less common in children, pediatric dentists are at high risk of contracting COVID-19. For this reason, pediatric dentists must assume that every person is potentially infected and follow unquestionably universal infection control procedures. In the current scenario, it is important to prioritize dental procedures labeled by World Health Organization as emergencies to reduce the COVID-19 transmission risk. Pediatric dentists in Turkey must encourage the use of minimally invasive procedures that greatly reduce or even eliminate aerosol formation while the pandemic continues to exist.

Ethics

Ethics Committee Approval: Ethical permission required for the study to be carried out was obtained from Gaziosmanpasa Training and Research Hospital, Medical Research Local Ethics Board (number: 179, date: 21.10.2020).

Informed Consent: A brief introduction was presented at the beginning of the survey to inform the respondents of the purpose and content of this study, and electronic informed consent was obtained if they agreed to complete the questionnaire.

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Authorship Contributions

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