ORIGINAL PAPER

EVALUATION OF ACCESS AND ATTITUDES OF PATIENTS TO DENTAL TREATMENTS DURING COVID-19 PANDEMIC

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ABSTRACT

Introduction: The novel coronavirus disease (COVID-19) restricted patients to reach healthcare personnel and postponed chronic diseases follow-ups.

Objectives: Our study aimed to evaluate the dental treatment processes of patients and the effects of these processes on oral health from patient' perspective.

Material and methods: A questionnaire consisting of COVID-19 and dental procedures was filled by patients applied to dental faculty. Data were evaluated using Pearson's χ^2 test. $P < 0.05$ was considered statistically significant.

Results: A total of 403 patients (248 females/155 males) participated in the present study. Toothache, abscess, and impacted tooth (27.8%) were the main reasons for the participants to apply to the hospital, followed by caries and filling (22.3%). Most of the participants (52.5%) did not hesitate to go to the dentist, but 60.8% of them postponed their treatment during the pandemic. More than half of the patients (56.1%) thought that dental procedures were risky in terms of COVID-19 transmission. The younger age group was less hesitant compared with the middle ages ($p < 0.05$). High school (65.7%) and university (58.7%) graduates believed that the risk of COVID-19 transmission from dental procedures was higher than in other groups ($p < 0.05$). Vaccinated individuals were statistically more hesitant of going to the dentist than those who were not vaccinated ($p < 0.05$).

Conclusions: The results of this study showed that toothache, abscess, and impacted tooth were the first reasons for applying to the dental hospital. Most of the patients stated that they hesitated to go to the dentist and postponed their treatments during the pandemic. Patients with higher education levels had a higher rate of vaccination.

Key words: COVID-19, dental care, dentistry, dental patients, questionnaire.

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INTRODUCTION

In December 2019, a previously undetected coronavirus in humans was identified in Wuhan, China's Hubei province [1]. The World Health Organization (WHO) has named this virus, which causes pneumonia of unknown origin in humans, as a new coronavirus (2019-nCoV). Later, due to its' taxonomic similarity with the virus, which is the causative agent of severe acute respiratory syndrome (SARS), it was deemed appropriate to be named 'SARS-CoV-2' (COVID-19) [2]. Number of cases infected with this new coronavirus has increased rapidly since the first day of diagnosis and spread globally, and this coronavirus disease, briefly referred to

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as 'COVID-19', was declared as a pandemic disease by the WHO on March 11, 2020 [3]. With the increase in cases, studies examining the clinical and epidemiological features of the disease have gained momentum. Although clinical signs in people infected with SARS-CoV-2 are fever, dry cough, and malaise, these symptoms are not distinctive compared with other respiratory diseases. While most cases heal spontaneously, some develop fatal complications, including organ failure, pulmonary edema, severe pneumonia, and acute respiratory distress syndrome (ARDS) [4, 5]. Considering the contamination by droplets and aerosols, dentists constitute a high-risk group.

On March 10, it was reported that the first COVID-19 case was confirmed in Turkey. As of March 12, schools were suspended and online education was started, overseas assignments were postponed, and sports competitions were played without spectators. All events, where people would gather together, have been canceled. Subsequently, businesses, such as entertainment venues, restaurants, cafes, barbers, restaurants where people would come together and increase the risk of transmission of the virus, were closed to service. A restriction was imposed on citizens over the age of 65, and this ban was extended to include young people and children under the age of 20. Dentists working in public hospitals participated in PCR application for the diagnosis of COVID-19. In private practices and university hospitals, only emergency dental procedures were allowed. The fact that people could not go to hospitals due to restrictions, and that they did not go to hospitals due to the risk of COVID-19 contamination when the restrictions were over, caused an increase in dental problems.

OBJECTIVES

The current study evaluated the perceptions and attitudes of patients who applied to the dentistry faculty of our university during COVID-19.

MATERIAL AND METHODS

This study was approved by the Ministry of Health, Republic of Turkey (No: 2020-05-20T15_30_12). Ethical approval was received from the Non-Interventional Studies ethics committee of Pamukkale University (No: 60116787-020-106820/17).

All patients who applied to Pamukkale University, Faculty of Dentistry between September, 2021 and November, 2021 were invited to participate in the study. Participation in the survey was voluntary. Patients over 18 years were included, and no information was requested regarding identity information of participants (i.e., name, surname, or identification number). In this study, patients who applied to the faculty of dentistry during the COVID-19 period were requested to fill out a questionnaire consisting of questions, including reasons for their application, dental procedures they had during this period, and where these procedures have been performed (Table 1). Results were evaluated with Pearson's χ^2 test, and $p < 0.05$ was taken as statistically significant. Data obtained from the study were presented as mean and frequency.

RESULTS

A total of 403 individuals participated in the study. 248 (61.5%) of the participants were females and 155 (38.2%) were males. Most of the participants (52.1%) were between the ages of 18-30 years. Considering the educational status of participants, the most people were high school (33.6%) and university graduates (35.8%). Most of the surveyors (62.7%) were unemployed. Details of the demographic data are shown in Table 1.

Toothache, abscess, or impacted tooth (27.8%) were the main reasons for the participants to apply to the hospital, followed by caries and filling (22.3%). Most surveyors (36.2%) preferred the university hospital as they thought that physicians were more interested and competent in their field. Most of the participants (52.5%) did not hesitate to go to the dentist, but 60.8% of them postponed their treatment during the pandemic. Two-third of the participants (65.9%) were vaccinated against COVID-19. Most of the participants (56.1%) thought that dental procedures were risky in terms of COVID-19 transmission. If the number of cases increases significantly, 44% of them stated to delay their treatment (Table 1).

Comparison of the questions by gender and age groups are presented in Table 2. Among those who hesitated to go to the dentist, women were statistically significantly higher than men ($p < 0.05$). In terms of age groups, the younger age group was less hesitant compared with middle ages ($p < 0.05$). In the period of delaying the treatment, while the middle age group (46.6%) waited for the pandemic to end, younger ages (31.9%) did not wait for it ($p < 0.05$). When vaccination statuses were examined, vaccination between the ages of 31-64 years was found to be statistically higher than in the age range of 18-30 years ($p < 0.05$).

Comparison of the questions by education status and working groups are shown in Table 3. Vaccination rates of university graduates were statistically higher than other education groups ($p < 0.05$). High school (65.7%) and university (58.7%) graduates thought that the risk of COVID-19 transmission from dental procedures was higher than reported in other groups. Most of the participants who waited for the pandemic process to pass for dental treatments were in the unemployed group (34.6%); however, the private sector employees (51.9%) had a higher ratio than the unemployed group ($p < 0.05$). In terms of not delaying treatment, no difference was found between sectors, in which people work

TABLE 1. Descriptive analysis of demographics, questions, and answers

Demographic data	*n*	%
Gender		
Female	248	61.5
Male	155	38.2
Age, years		
18-30	210	52.1
31-64	191	47.4
≥ 65	2	0.5
Educational status		
Primary school	60	15.0
Secondary school	60	15.0
High school	134	33.6
University	143	35.8
Master/PhD	6	0.5
Working status		
Not working	245	62.7
Retired	32	7.0
Government employee	48	11.5
Private sector	76	18.8
Questions		
Reason for applying to the hospital		
Toothache, abscess, impacted tooth	125	27.8
Teeth cleaning, gum disease	60	13.4
Missing teeth, prosthesis	22	4.9
Caries, filling	100	22.3
Orthodontics	44	9.8
Other	98	21.8
Reason for choosing hospital/faculty during the COVID-19 pandemic		
Did you hesitate to go to the dentist because of the COVID-19 pandemic?		
I think it is more hygienic	81	18.8
I think COVID-19 prevention measures are well-taken	78	18.1
I think the costs of treatments are low	36	8.4
I think that physicians are more interested and competent in their field	156	36.2
Other	80	18.6
Yes	213	52.5
No	190	47.5
Have you postponed your treatments during the COVID-19 pandemic?		
Yes	247	60.8
No	156	39.2

TABLE 1. Cont.

Questions		
If you have postponed your treatments, how long have you been waiting?		
During the pandemic	154	38.3
During the normalization process	100	24.6
I did not postpone	149	37.1
Are you vaccinated?		
Yes	265	65.9
No	137	34.1
Do you think there is a risk of COVID-19 transmission in dental procedures?		
Yes	225	56.1
No	178	43.9
Which dental treatment clinic would you prefer during the pandemic?		
Private practice, clinic	34	8.3
Oral and dental health center of government	64	15.3
University hospital	301	76.4
Do you think your oral health is getting worse because you postponed your treatment?		
Yes	286	71.5
No	117	28.5
Would you postpone your treatment if the number of cases increased significantly again?		
Yes	117	44.0
No	226	56.0

or are unemployed ($p > 0.05$). According to working status, the highest vaccination rates were retirees (79.3%) and private sector employees (80.5%). Retirees stated that if the cases increase with a high-rate (62.1%), they will postpone their treatment as well as private sector employees (55.8%) and civil servants (43.8%). The unemployed group with a rate of 61.8% reported that they would not postpone their treatment.

It was found that vaccinated people were statistically more hesitant of going to the dentist than those who were not vaccinated ($p < 0.05$) (Table 4).

DISCUSSION

The current COVID-19 outbreak is a worldwide emergency, as its' rapid spread and high mortality rate have caused severe disruptions. As in many developed countries, many scientific and legal regulations have been made in Turkey, and at the beginning of the pandemic process, in line with the recommenda-

TABLE 2. Comparison of the questions by gender and age groups

Questions[¶]	Answers	Gender			Age groups				Total
		Female, *n* (%)	Male, *n* (%)	*p*-value	18-30 years, *n* (%)	31-64 years, *n* (%)	65 years and over, *n* (%)	*p*-value	
Hesitation of dental visit	Yes	142 (57.0)[a]	71 (46.1)[b]	0.040*	94 (44.8)[a]	119 (62.3)[b]	0 (0.0)[a,b]	0.001*	213 (52.7)
	No	107 (43.0)[a]	83 (53.9)[b]		116 (55.2)[a]	72 (37.7)[b]	2 (100.0)[a,b]		190 (47.3)
Postponement of treatment	Yes	156 (62.7)	89 (57.8)	0.346	121 (57.6)	124 (64.9)	0 (0.0)	0.069	245 (60.8)
	No	93 (37.3)	65 (42.2)		89 (42.4)	67 (35.1)	2 (100.0)		158 (39.2)
Waiting period	During the pandemic	91 (36.5)	65 (42.2)	0.144	67 (31.9)[a]	89 (46.6)[b]	0 (0.0)[a,b]	0.002*	156 (38.7)
	During the normalization	70 (28.1)	30 (19.5)		62 (29.5)[a]	36 (18.8)[b]	2 (100.0)[a]		100 (24.8)
	Not postponed	88 (35.3)	59 (38.3)		81 (38.6)[a]	66 (34.6)[b]	0 (0.0)[a]		147 (36.5)
Vaccination status	Yes	155 (62.2)	109 (70.8)	0.085	111 (52.9)[a]	151 (79.1)[b]	2 (100.0)[a,b]	0.001*	264 (65.5)
	No	94 (37.8)	45 (29.2)		99 (47.1)[a]	40 (20.9)[b]	0 (0.0)[a,b]		139 (34.5)
Dental transmission risk awareness	Yes	144 (57.8)	82 (53.2)	0.409	108 (51.4)	116 (60.7)	2 (100.0)	0.078	226 (56.1)
	No	105 (42.2)	72 (46.8)		102 (48.6)	75 (39.3)	0 (0.0)		177 (43.9)
Clinical preference	Private	28 (11.2)	8 (5.2)	0.118	19 (9.0)	17 (8.9)	0 (0.0)	0.916	36 (8.9)
	Public dental hospital	38 (15.3)	25 (16.2)		31 (14.8)	32 (16.8)	0 (0.0)		63 (15.6)
	University	183 (73.5)	121 (78.6)		160 (76.2)	142 (74.3)	2 (100.0)		304 (75.4)
Oral health awareness	Yes	188 (75.5)[a]	101 (65.6)[b]	0.040*	149 (71.0)	138 (72.3)	2 (100.0)	0.645	289 (71.7)
	No	61 (24.5)[a]	53 (34.4)[b]		61 (29.0)	53 (27.7)	0 (0.0)		114 (28.3)
Possibility of postponement	Yes	105 (42.2)	72 (46.8)	0.409	77 (36.7)[a]	98 (51.3)[b]	2 (100.0)[a,b]	0.004*	177 (43.9)
	No	144 (57.8)	82 (53.2)		133 (63.3)[a]	93 (48.7)[b]	0 (0.0)[a,b]		226 (56.1)

*Complete version of the questions is presented in Table 1. *p < 0.05. Each subscript letter denotes a subset of the categories whose column proportions do not differ significantly from each other at 0.05 level.*

TABLE 3. Comparison of the questions by education status and working groups

Questions[¶]	Answers	Education status						Working status				
		Primary, *n* (%)	Secondary, *n* (%)	High, *n* (%)	University, *n* (%)	Master/ PhD, *n* (%)	*p*-value	Unemployed, *n* (%)	Retired, *n* (%)	Government officer, *n* (%)	Private, *n* (%)	*p*-value
Hesitation of dental visit	Yes	35 (58.3)	28 (46.7)	80 (59.7)	68 (47.6)	0 (0.0)	0.091	128 (51.4)	14 (48.3)	21 (43.8)	50 (64.9)	0.087
	No	25 (41.7)	32 (53.3)	54 (40.3)	75 (52.7)	2 (100.0)		121 (48.6)	15 (51.7)	27 (56.3)	27 (35.1)	
Postponement of treatment	Yes	36 (60.0)	37 (61.7)	83 (61.9)	85 (59.4)	0 (0.0)	0.512	155 (62.2)	17 (58.6)	25 (52.1)	48 (62.3)	0.597
	No	24 (40.0)	23 (38.3)	51 (38.1)	58 (40.6)	2 (100)		94 (37.8)	12 (41.4)	23 (47.9)	29 (37.7)	
Waiting period	During the pandemic	25 (41.7)	19 (31.7)	56 (41.8)	54 (37.8)	0 (0.0)	0.170	87 (34.9)[a]	10 (34.5)[a,b]	19 (39.6)[a,b]	40 (51.9)[b]	0.029*
	During the normalization	10 (16.7)	17 (28.3)	27 (20.1)	44 (30.8)	0 (0.0)		74 (29.7)[a]	8 (27.6)[a,b]	10 (20.8)[a,b]	8 (10.4)[b]	
	Not postponed	25 (41.7)	24 (40.0)	51 (38.1)	45 (31.5)	2 (100.0)		88 (35.3)[a]	11 (37.9)[a]	19 (39.6)[a]	29 (37.7)[a]	
Vaccination status	Yes	32 (53.3)[a]	33 (55.0)[a]	80 (59.7)[a]	117 (81.8)[b]	2 (100.0)[a,b]	0.001*	142 (57.0)[a]	23 (79.3)[a,b]	37 (77.1)[a,b]	62 (80.5)[b]	0.001*
	No	28 (46.7)[a]	27 (45.0)[a]	54 (40.3)[a]	26 (18.2)[b]	0 (0.0)[a,b]		107 (43.0)[a]	6 (20.7)[a,b]	11 (22.9)[a,b]	15 (19.5)[b]	
Dental transmission risk awareness	Yes	26 (43.3)[a]	24 (40.0)[a]	88 (65.7)[b]	84 (58.7)[a,b]	2 (100.0)[a,b]	0.002*	141 (56.6)	14 (48.3)	28 (58.3)	43 (55.8)	0.838
	No	34 (56.7)[a]	36 (60.0)[a]	46 (34.3)[b]	59 (41.3)[a,b]	0 (0.0)[a,b]		108 (43.4)	15 (51.7)	20 (41.7)	34 (44.2)	
Clinical preference	Private	2 (3.3)	2 (3.3)	18 (13.4)	14 (9.8)	0 (0.0)	0.233	23 (9.2)[a,b]	1 (3.4)[a,b]	9 (18.8)[b]	3 (3.9)[a]	0.001*
	Public dental hospital	12 (20.0)	8 (13.3)	22 (16.4)	19 (13.3)	0 (0.0)		31 (12.4)[a]	11 (37.9)[b]	6 (12.5)[a,b]	15 (19.5)[a,b]	
	University	46 (76.7)	50 (83.3)	94 (70.1)	110 (76.9)	2 (100.0)		195 (78.3)[a]	17 (58.6)[a]	33 (68.8)[a]	59 (76.6)[a]	
Oral health awareness	Yes	36 (60.0)[a]	48 (80.0)[a]	94 (72.4)[a]	104 (72.7)[a]	0 (0.0)[a]	0.025*	186 (74.7)	19 (65.5)	27 (56.3)	57 (74.0)	0.057
	No	24 (40.0)[b]	12 (20.0)[a]	37 (27.6)[a]	39 (27.3)[a]	2 (100.0)[b]		63 (23.3)	10 (34.5)	21 (43.8)	20 (26.0)	
Possibility of postponement	Yes	24 (40.0)	28 (47.7)	67 (50.0)	56 (39.2)	2 (100.0)	0.170	95 (38.2)[a]	18 (62.1)[a,b]	21 (43.8)[a,b]	43 (55.8)[b]	0.009*
	No	36 (60.0)	32 (53.3)	67 (50.0)	87 (60.8)	0 (0.0)		154 (61.8)[a]	11 (37.9)[a,b]	27 (56.3)[a,b]	34 (44.2)[b]	

*Complete version of the questions is presented in Table 1. *p < 0.05. Each subscript letter denotes a subset of the categories whose column proportions do not differ significantly from each other at 0.05 level.*

TABLE 4. Comparison of the questions by vaccination status

Questions[¶]	Answers	Vaccination status		
		Vaccinated, *n* (%)	Not vaccinated, *n* (%)	*p*-value
Hesitation of dental visit	Yes	155 (58.7)[a]	58 (41.7)[b]	0.002*
	No	109 (41.3)[a]	81 (58.3)[b]	
Postponement of treatment	Yes	164 (62.1)	81 (58.3)	0.455
	No	100 (37.9)	58 (41.7)	
Waiting period	During the pandemic	110 (41.7)	46 (33.1)	0.220
	During the normalization	64 (24.2)	36 (25.9)	
	Not postponed	90 (34.1)	57 (41.0)	
Dental transmission risk awareness	Yes	155 (58.7)	71 (51.1)	0.170
	No	109 (41.3)	68 (48.9)	
Clinical preference	Private	20 (7.6)	16 (11.5)	0.420
	Public dental hospital	42 (15.9)	21 (15.1)	
	University	202 (76.5)	102 (73.4)	
Oral health awareness	Yes	200 (75.8)[a]	89 (64.0)[b]	0.015*
	No	64 (24.2)[a]	50 (36.0)[b]	
Possibility of postponement	Yes	118 (44.7)	59 (42.4)	0.674
	No	146 (55.3)	80 (57.6)	

*Complete version of the questions is presented in Table 1. *p < 0.05. Each subscript letter denotes a subset of the categories whose column proportions do not differ significantly from each other at 0.05 level.*

tions of the Ministry of Health Coronavirus Scientific Advisory Board, a circular was issued by the Ministry of Health, General Directorate of Health Services, on March 17, 2020, allowing emergency and compulsory dental treatments only and postponing elective procedures. Following the publication of the "Guide to Work in Health Institutions during the normalization period in the COVID-19 pandemic" issued by the Ministry of Health on June 1, 2020, the previously postponed elective treatments started to be carried out again, with priority in the provision of emergency and mandatory services, in line with working principles in this guide. These decisions led to the patients not being able to meet their treatment needs other than emergency dental treatments. The purpose of our survey study was to evaluate the dental treatment processes of patients and the effects of these processes on their oral health from the patients' perspectives. The COVID-19 pandemic is affecting lives of many people, causing an increase feeling of uncertainty and anxiety in people [6]. The survey results in this study revealed that most patients postponed their dental treatment in the pandemic and normalization process, and because of this situation, 71.5% of the patients believed that their oral health worsened. Patients were largely aware of the seriousness of the COVID-19 pandemic and reported concerns. In addition to postponing their dental treatments, the patients postponed follow-up of their potentially fatal diseases, either because of the limited number of health personnel or the fear of disease transmission [7]. In our study, 56% of the patients stated that they would not delay their treatment if there was a pandemic again. Peleso *et al.* [8] found that 38.3% of the patients stated they would go for a dental appointment if the dentist/staff called to schedule, 44.2% said they would go only in case of an emergency, and 17.5% said they would not go for any reason. Although there was no difference between men and women in terms of delaying treatment in our study, women (57%) and the middle age group (62.3%) seem to be more hesitant about going to dental treatment. The literature suggests that women are more amenable to dental treatment than men in normal situations [9]. However, in studies conducted during the pandemic, it was found that the pandemic increased the stress level in women more than in men [10]. Probably, women felt safer to stay at home or just go to the dentist in case of emergency. Due to many underlying biological mechanisms, women may be more prone to depression and anxiety disorders [11], and may be particularly affected by stressful events [12].

To combat the coronavirus disease, many researchers have focused on developing effective vaccine. According to the survey results, the vaccination rate of women (62.2%) was found to be lower than that of men (70.8%). Inconsistent with our study, a study [13] reported that women in Turkey were more hesitant about the COVID-19 vaccination. This may be because they are more likely to come across anti-vaccine data in their

online research on vaccines, as women are usually caring for children or they may not need to be vaccinated since women do not take as active roles as men in social life in Turkey. Among the education group, university graduates (81.8%) presented the highest vaccination rate in contrast with a survey performed in Turkey, which resulted in low educational level cases who were more willing to get vaccinated [14]. The lowest vaccination rate was found in the unemployed group (57.0%), and the highest vaccination rate was found in the private sector group (80.5%). According to the results found in studies, from 31% to 43% of people are hesitant to be vaccinated [14, 15]. Currently, there is no vaccination requirement for government employees in Turkey, but there is unofficial pressure on private sector employees to be vaccinated. Here, those who cannot work may not have preferred to be vaccinated because they do not have concerns about losing their jobs. Although, 58.7% of those who were vaccinated hesitated to go to dental treatments. The reason for this may be due to the low confidence of people in the effects of the vaccine, adverse effects, or considering that coronavirus is a virus of laboratory origin despite being vaccinated [16].

CONCLUSIONS

The results of the present study showed that toothache, abscess, and impacted tooth were the first reasons for applying to the dental hospital. Most of the patients stated that they hesitated to go to the dentist and postponed their treatments during the COVID-19 pandemic. Patients with higher education levels had a higher rate of vaccination. Vaccinated patients were statistically more hesitant of going to the dentist than unvaccinated.

CONFLICT OF INTEREST

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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