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Evaluation of the Fear and Anxiety Caused by the COVID-19 Outbreak Among Dentists

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ABSTRACT

Objective: Dental treatment procedures carry a high risk of COVID-19 infection due to face-to-face contact with patients and dental staff, which has a psychological impact on dentists. In this study, it was aimed to examine the effect of the COVID-19 pandemic on the fear and anxiety levels of dentists. **Materials and Methods:** An online cross-sectional questionnaire survey comprising of 8 questions was conducted among dental practitioners of Turkey. The following 8-item scale to assess participants' fear and anxiety levels in the COVID-19 pandemic was designed. Differences in fear and anxiety level about COVID-19 pandemic based on participants' demographic characteristics were analyzed with Chi-square test. Results were reported as statistically significant at $p<0.05$. **Results**: Totally 250 dentists participated in the survey and 69.7% of the participants were female, 30.3% of them were male. Statistical analysis of the data obtained showed that the fear levels was generally significantly higher for women than for men ($p<0.05$). It is seen that those who work in the filiation team are statistically more afraid of being infected ($p=0.001$), carrying the infection to their close surroundings ($p=0.013$). **Conclusion:** This study shows the data of fear experienced during COVID-19 among dentists in Turkey.

Keywords: Fear, Anxiety, COVID-19, Pandemic, Dentist.

COVID-19 Salgınının Diş Hekimleri Arasında Yarattığı Korku ve Kaygının Değerlendirilmesi

ÖZ

Amaç: Diş tedavi prosedürleri hastalar ve diş ekibi ile yüz yüze iletişim nedeniyle yüksek bir COVID-19 enfeksiyonu riski taşımakta bu durum da diş hekimleri üzerinde psikolojik etki yaratmaktadır. Bu çalışmada, COVID-19 pandemisinin diş hekimleri üzerindeki korku ve kaygı düzeylerine etkisinin incelenmesi amaçlanmıştır. **Gereç ve Yöntem:** Türkiye'deki diş hekimleri arasında 8 sorudan oluşan çevrimiçi bir kesitsel anket çalışması yapılmıştır. Katılımcıların COVID-19 pandemisindeki korku ve kaygı düzeylerini değerlendirmek için 8 maddelik ölçek tasarlanmıştır. Katılımcıların demografik özelliklerine göre COVID-19 pandemisi ile ilgili korku ve kaygı düzeylerindeki farklılıklar Ki-kare testi ile analiz edildi. Sonuçlar, $p<0.05$'te istatistiksel olarak anlamlı olarak rapor edildi. **Bulgular:** Ankete toplam 250 diş hekimi katılmış olup, katılımcıların %69.7'si kadın, %30.3'ü erkektir. Elde edilen verilerin istatistiksel analizi, korku düzeylerinin kadınlarda erkeklere göre genel olarak anlamlı düzeyde yüksek olduğunu göstermiştir ($p<0.05$). Filyasyon ekibinde çalışanların enfeksiyon kapmaktan ($p=0.001$), enfeksiyonu yakın çevrelerine taşımaktan ($p=0.013$) istatistiksel olarak daha fazla korktukları görülmektedir. **Sonuç:** Bu çalışma, Türkiye'deki diş hekimleri arasında COVID-19 sırasında yaşanan korkunun verilerini göstermektedir.

Anahtar Kelimeler: Korku, Kaygı, COVID-19, Salgın, Diş Hekimi.

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INTRODUCTION

The new type of coronavirus (2019-nCoV), which belongs to the coronavirus family, first appeared in Wuhan, China in December 2019. Due to its taxonomic similarity with the virus, which is the SARS agent, it has been named Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) or Coronavirus Disease 2019 (COVID-19). In the following months, this new pathogen spread throughout Europe and then worldwide. In March 2020, the World Health Organization (WHO) officially declared a pandemic alert for this epidemic situation (Checchi et al., 2017; Huang et al., 2020; Lu et al., 2020).

COVID-19 belongs to the corona viridae family of viruses and is characterized by a single-stranded RNA structure (Khurshid et al., 2020). Sars-CoV-2 has membrane proteins that allow adhesion between itself and specific receptors on the surface of host tissue cells. Angiotensin-converting enzyme 2 (ACE-2), the most common receptor for virus-cell interaction, is present in high concentrations in the lungs, myocardial cells and kidney, as well as in the oral mucosa, particularly salivary glands and tongue. These structures are recognized as early targets of Sars-CoV-2, which causes the disease known as Corona Virus Disease 19 (COVID-19) in humans (Meng et al., 2020; Xu et al., 2020; Yan et al., 2020).

The main infection pathways of Sars-CoV-2 are air and direct contact. It can be easily transmitted through hand contact, saliva, nasal drops and contaminated surfaces (Chen et al., 2020; Liu et al., 2011; Peng et al., 2020). Saliva also plays a critical role in the spread of infection, both through air and direct contact (Peng et al., 2020). Therefore, dentists are at the top of the occupational groups with high risk of exposure to viral pathogens that can be transmitted through the oral cavity and respiratory tract during dental visits. Dental procedures, by their very nature, carry a high risk of COVID-19 infection due to face-to-face communication with patients and the dental team. In addition, frequent contamination with saliva, blood, and other body fluids, as well as the use of sharp and high-speed rotary instruments, increases the risk of infection in dental practice (Barbari & Keyvan, 2020; Thoracic, 2020). Considering all these, dentists in the high-risk group can experience an increase in anxiety levels along with the fear of catching COVID-19 and transmitting the disease to their relatives and patients (Thoracic, 2020).

In this study, it is aimed to examine the effect of the COVID-19 pandemic on the levels of fear and anxiety on dentists, and the relationship between individuals' sociodemographic characteristics and their fear and anxiety levels.

MATERIALS AND METHODS

Study type

This study was a questionnaire based cross-sectional survey. A questionnaire was developed to assess participants' fear and anxiety toward COVID-19 and provided information on their demographic characteristics According to the 2020 data of the Turkish Dental Association, there are 39000 dentists in Turkey. Considering this universe, the sample size was calculated as a minimum of 207 with a 5% margin of error in the 85% confidence interval. The study population comprised of 250 dentists and specialist dentists ranging in age 18 to 65 years and over, were selected by haphazard sampling model. Data were collected via an online survey link via forms made by Google forms. This questionnaire was conducted between March 1 and March 30, 2021. The fear and anxiety that dentists experienced during dental practices in the COVID-19 pandemic were evaluated. The exclusion criteria was a questionnaire that individiuals had not completed, for whatever reason.

Data measurements

Participant demographics

The distribution of basic demographic information included participants' age, gender, education level, working status, dentistry specialty, working situations in the filiation team, professional experience and additional income status were evaluated.

Fear and anxiety levels of dentists in the COVID-19 pandemic

The following 8-item scale to assess participants' fear and anxiety levels in the COVID-19 pandemic was designed. The items included: (1) I am afraid of being infected with COVID-19 by a patient or colleague. (2) I am afraid that my patients will be infected with COVID-19 during dental applications. (3) I am afraid of carrying the infection I got during dental applications to my family and relatives. (4) I am concerned when applying aerosol-releasing dental procedures. (5) I am concerned when applying non-aerosol dental procedures. (6) I feel nervous when talking to patients at close distance. (7) I am worried about the treatment I will receive when I am infected with COVID-19. (8) I am concerned that I will not be able to regain my old health after I recovered from COVID-19. The responses of the participants to these questions were evaluated using the Likert 5-point scale: "I agree, I partly agree, I am undecided, I partially disagree, I disagree". The results of preliminary testing (30 subjects) of the questionnaire were evaluated through SPSS to determine the validity (KMO=0.78) and the reliability of the research (Cronbach's alpha=0.92).

Statistical analysis

Collected data were processed statistically using statistical package program (SPSS 20.0, IBM Corp., Armonk, NY, USA). Descriptive statistics (frequencies, standard deviations, means, ranges and proportions) were used to summarize the data. Differences in fear and anxiety level about COVID-19 pandemic based on participants' demographic characteristics were analyzed with Chi-square test. Results were reported as statistically significant at $p<0.005$.

Ethical approval

This cross-sectional study was completed compatible with the Helsinki Declaration presented in 1975 which is revised in 2000. Ethical approval of the study protocol was obtained from the Research Ethical Board of Istanbul

University-Cerrahpaşa, Faculty of Medicine, Istanbul, Turkey (No:E-59491012-604.01.02-24038).

RESULTS

Demographic data of participants in the survey are shown in Table 1. Totally 250 dentists participated in the survey and 69.7% of the participants were female, 30.3% of them were male. The age prevelance ranged from 2.1% at age 18-25 years, 35.2% at age 26-35 years, 39.3% at age 36-years to 23.4% at 51 years and over. 66.9% of the participants stated their marital status as married and 33.1% as single. 97.9% of the participants were working and the working type of the participants was reported as 75.2% full-time and 24.8% part-time. 36.6% of dentists are working in the special clinics, 6.2% in public hospitals, 23.4% in policlinics, 3.4% in special hospitals and 38.6% in university hospitals. Dentists' specialities are 8.3% oral surgery, 2.1% oral and maxillofacial radiology, 24.1% pedodontics, 9% restorative dentistry, 4.8% endodontics, 6.9% periodontology, 6.2% prosthodontics and 4.8% orthodontics, while 40% of dentists do not have any speciality. The percentage of dentists to take part in the filiation team during the pandemic period is 4.8%. According to the information obtained; 6.9 % of dentists have practiced in dentistry for 0-3 years, 6.2% for 3-5 years, 20.7% for 5-10 years, 27.6% for 10-20 years, 23.4% for 20-30 years, 15.2% for 30 years and over. While 13.8% of dentists have an additional source of income, 86.2% do not have an additional source of income.

Table 1. Distribution of demographic data.

		%
Gender	Female	69.7
	Male	30.3
Age	18-25 years	2.1
	26-35 years	35.2
	36-50 years	39.3
	50 + years	23.4
Marital status	Married	66.9
	Single	33.1
Working type	Full time	75.2
	Part time	24.8
Specialty	None	40.0
	Oral surgery	8.3
	Oral and maxillofacial radiology	2.1
	Pedodontics	24.1
	Restorative dentistry	9.0
	Endodontics	4.8
	Periodontology	6.9
	Prosthodontics	6.2
	Orthodontics	4.8
Filiation team	Yes	4.8
	No	95.2
Practice years	0-3 year	6.9
	3-5 year	6.2
	5-10 year	20.7
	10-20 year	27.6
	20-30 year	23.4
	30+ year	15.2
Practice type	Special clinic	36.6
	Public hospital	6.2
	Policlinic	23.4
	Special hospital	3.4
	University hospital	38.6
Additional income	Yes	13.8
	No	86.2

In Table 2 there is description of the fear and stress levels of dentists towards COVID-19. 78 % of the dentists reported that they are afraid of being infected with COVID-19 by a patient or colleague. 77.3% of the dentists stated that they are afraid that their patients will be infected with COVID-19 during dental applications. Similarly, 88.3% of the dentists said that they are afraid of carrying the infection they got during dental applications to their family and relatives. While 80% of dentists stated that they were worried when applying aerosol-releasing dental procedures, 49% reported that they were worried when applying non-aerosol releasing dental procedures. 69.6% of the dentists reported that they feel nervous when talking to patients at close

distance.73.1% of the dentists said that they are worried about the treatment they will receive when they are infected with COVID-19 and 71.1% of dentists said that they are concerned that they will not be able to regain their old health after they recovered from COVID-19.

Table 2. Distribution of survey response.

Question	Responses	%
I am afraid of being infected with COVID-19 by a patient or colleague.	I agree absolutely	42.8
	I agree	35.2
	I am undecided	7.6
	I disagree	11.7
	I disagree absolutely	2.8
I fear that my patients may become infected with COVID-19 during dental practices.	I agree absolutely	36.6
	I agree	40.7
	I am undecided	4.1
	I disagree	15.9
	I disagree absolutely	2.8
I am afraid of carrying the infection I got during dental practices to my family and relatives.	I agree absolutely	67.6
	I agree	20.7
	I am undecided	4.1
	I disagree	6.9
	I disagree absolutely	0.7
I am concerned when performing aerosol-inducing dental procedures.	I agree absolutely	51.0
	I agree	29.9
	I am undecided	9.0
	I disagree	9.7
	I disagree absolutely	1.4
I am concerned when performing non-aerosol-releasing dental procedures.	I agree absolutely	21.4
	I agree	27.6
	I am undecided	17.2
	I disagree	23.4
	I disagree absolutely	10.3
I feel nervous when talking to patients at close distance.	I agree absolutely	38.6
	I agree	31.0
	I am undecided	7.6
	I disagree	17.9
	I disagree absolutely	4.8
I am concerned about the treatment I will receive when I am infected with COVID-19.	I agree absolutely	46.2
	I agree	26.9
	I am undecided	13.1
	I disagree	12.4
	I disagree absolutely	1.4
I am worried that I will not be able to regain my old health after being infected with COVID-19 and recovered.	I agree absolutely	49.7
	I agree	21.4
	I am undecided	13.8
	I disagree	10.3
	I disagree absolutely	4.8

The demographic data and the levels of being infected with COVID-19 were statistically compared in Table 3. Statistical analysis of the data obtained showed that the fear levels was generally significantly higher for women than for men ($p<0.05$).

It is seen that those who work in the filiation team are statistically more afraid of being infected ($p=0.001$), carrying the infection to their close surroundings ($p=0.013$), the treatment they will receive ($p=0.000$) and not being able to regain their former health (0.026) (Table 4).

Table 3. Comparison of the gender and fear-anxiety levels of dentists in the COVID-19 pandemic.

Gender	Male					Female					p*
	++	+	**0**	-	--	++	+	**0**	-	--	
Q.1 (%)	7	11	3	53	2	35	23	4	6	0,6	0.017
Q.2 (%)	8	15	2	2	2	28	25	2	13	0,6	0.049
Q.3 (%)	16	8	2	2	0,6	51	12	2	4	0	0.150
Q.4 (%)	13	9	2	3	1	37	19	6	6	0	0.221
Q.5 (%)	6	8	4	4	6	15	18	13	18	4	0.079
Q.6 (%)	7	8	4	5	4	31	22	3	12	0,6	0.003
Q.7 (%)	8	10	4	5	1	37	16	8	6	0	0.012
Q.8 (%)	9	7	5	2	4	40	13	8	7	0	0.000

*Chi-square test

Table 4. Comparison of the situation in the filiation team and fear-anxiety levels of dentists in the COVID-19 pandemic.

Filiation team	Yes					No					p*
	++	+	**0**	-	--	++	+	**0**	-	--	
Q.1 (%)	2	0.6	0.6	0	1	45	34	6	11	2	0.001
Q.2 (%)	2	1	0.6	0	0.6	34	39	3	15	2	0.142
Q.3 (%)	3	0	1	0	0	64	20	2	6	0,6	0.013
Q.4 (%)	3	0.6	0	0.6	0	47	28	9	9	1	0.723
Q.5 (%)	2	0.6	0.6	0.6	0.6	19	26	16	22	9	0.65
Q.6 (%)	2	1	0	1	0	36	29	7	16	4	0.84
Q.7 (%)	2	0,6	0,6	0	1	44	26	12	12	0	0.000
Q.8 (%)	2	0	6	0	1	46	21	13	10	3	0.026

*Chi-square test
++= I agree absolutely; += I agree; 0= I am undecided; -= I disagree; --= I disagree absolutely

Table 5. Comparison of the marital status and fear-anxiety levels of dentists in the COVID-19 pandemic

Marital status	Married					Single					p*
	++	+	**0**	-	--	++	+	**0**	-	--	
Q.1 (%)	27	26	6	4	1	15	8	1	6	1	0.062
Q.2 (%)	24	28	2	9	2	11	12	1	6	0.6	0.837
Q.3 (%)	44	15	4	2	0	22	5	0	4	0.6	0.065
Q.4 (%)	36	20	6	2	0,6	14	9	2	6	0.6	0.027*
Q.5 (%)	15	17	14	13	6	6	9	2	10	4	0.216
Q.6 (%)	24	20	6	11	4	13	10	1	6	0.6	0.603
Q.7 (%)	30	20	7	8	0,6	15	6	5	4	0.6	0.74
Q.8 (%)	32	15	10	4	3	17	5	3	5	1	0.372

*Chi-square yest
++= I agree absolutely; += I agree; 0= I am undecided; -= I disagree; --= I disagree absolutely

At the same time, it is seen that married dentists are more afraid when performing aerosol-generating procedures than unmarried dentists (p=0.027) (Table 5). Dentists working in private clinics and university hospitals have high levels of fear when their patients are infected with COVID-19, the infection is transmitted to their families, and they are applying procedures that do not release aerosols (p<0.05) (Table 6)

Table 6. Comparison of the practice type and fear-anxiety levels of dentists in the COVID-19 pandemic.

Practice type	Special clinic					Policlinic					Public hospital					Special hospital					University hospital					p*
	++	+	0	-	--	++	+	0	-	--	++	+	0	-	--	++	+	0	-	--	++	+	0	-	--	
Q.1 (%)	14	11	3	3	0.6	5	9	0	2	0.6	3	2	0	0	0	0.6	1	0	1	0	18	10	4	4	1	0.521
Q.2 (%)	14	11	1	5	1	4	11	0	1	0.6	3	2	0	0	0	0.6	0	0	2	0	13	15	2	6	0,6	0.036
Q.3 (%)	22	6	2	2	0.6	10	5	0	2	0	6	0	0	0	0	1	0.6	0	1	0	27	8	1	1	0	0.001
Q.4 (%)	18	10	2	2	0.6	6	6	1	2	0.6	6	0	0	0	0	0.6	1	0	1	0	18	11	5	3	0	0.133
Q.5 (%)	9	11	4	6	3	4	6	0	4	2	2	0,6	3	0	0	0	0.6	0	2	0	5	9	9	10	4	0.006
Q.6 (%)	13	9	2	5	2	5	4	2	3	1	3	1	0	1	0	0.6	0.6	0	2	0	15	15	2	5	0,6	0.446
Q.7 (%)	16	10	3	3	0	8	4	1	3	0	2	2	0	1	0	0.6	1	1	0	0	17	8	6	4	1	0.617
Q.8 (%)	15	6	6	2	2	10	3	1	2	0.6	4	0.6	0	1	0	1	0.6	0	1	0	17	9	6	3	1	0.591

*Chi-square test

++= I agree absolutely; += I agree; 0= I am undecided; -= I disagree; --= I disagree absolutely

DISCUSSION

Fear and anxiety are strong emotions that are frequently encountered during the epidemic period. Especially healthcare workers are a group that is exposed to intense psychological pressure during epidemic periods (Walton et al., 2020). The high risk of contracting infectious diseases in healthcare workers who constantly care for patients causes increased feelings of fear, stress and anxiety (Lai et al., 2020).

Since the primary transmission route of coronavirus is through droplets and aerosols, it increases the likelihood of dentists among healthcare professionals to become infected and spread the virus (Ahmed et al., 2020a). When the transmission routes are evaluated in the COVID-19 pandemic, dentistry is at the top of the high-risk professions group (Lu et al., 2020). In addition to being transmitted even by asymptomatic carriers, the very high rate of SARS-CoV 2 viral load in human saliva proves that dentists are in the high-risk group (Penf et al., 2020; Wang et al., 2019). In high-risk dentists, exposure to coronavirus can be feared to infect their relatives, peers and patients, and this can cause fear and anxiety in individuals (Ahmed et al., 2020b). Therefore, in this study, the levels of fear and anxiety experienced by In addition, there is a significant relationship between marital status, type of practice, and the status of taking part in filiation and the level of fear of catching COVID-19. Suryakumari et al., reported that no difference between the dentist's level of fear of transmitting the infection to their families and age, gender type of practice, years of practice (Suryakumari et al., 2020). This is confirmed by the finding of our study as well. One of the easiest and most recommended ways to reduce the transmission of the virus is to maintain physical distance. However, dental practices involve close contact with patients during routine treatments. For this reason, it is reported that dentists are afraid when talking to patients at close distance (Suryakumari et al., 2020). In our study, the rate of feeling nervous while talking at close distance was found to be 70%. In addition, the rate of feeling nervous while talking at close distance was statistically significantly higher than men ($p<0.03$).

In our study, unlike other studies, the fear levels of dentists who took part in the filiation team and those who could not work were compared. It has been determined that the fear levels of the dentists involved in filiation are less. This can be explained by the fact that the dentists working in the filiation team have protective equipment and have more information about this subject because they work closely with the disease.

CONCLUSION

Pandemic outbreaks cause widespread fear and mental problems throughout the population. However, the psychological consequences of diseases are often neglected. This study shows the data of fear experienced during COVID-19 among dentists in Turkey. The observed high levels of fear could provide a potential basis for future studies.

dentists during the COVID-19 pandemic were evaluated. In the study conducted with 650 participants in 30 different countries, it was stated that more than 2/3 (78%) of general dentists have anxiety and fears about the destructive effects of COVID-19 (Sakib et al., 2020). It has been stated in the studies that most of the dentist's fear being infected with COVID-19 due to a patient or a co-worker (Sakib et al., 2020; Suryakumari et al., 2020). In our study, although anxiety and fear levels were high in terms of disease transmission and transfer, it was observed that dentists (88,2%) were most afraid of carrying the infection to their families and relatives.

Mahdee et al. was stated that more than 80% of participants had anxiety of catching COVID-19 and also reported that the recorded anxiety level was higher amongst younger dentists and females (Mahdee et al., 2020). In other similar studies, no significant difference was found between dentists' "age, type of practice, years of practice" parameters and fear (Brooks et al., 2020; Sakib et al., 2020; Suryakumari et al., 2020; Soraci et al., 2020). In our study, the fear level of catching COVID-19 was found to be statistically higher in women than in men.

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Conflict of Interest

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

Author Contributions

Plan, design: SB, BG; **Material and Methods:** SB, BG; **Data analysis and interpretation**: BG; **Writing and corrections:** SB.

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