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The Anxiety and Psychological Resilience of Dentists During COVID-19: A Cross-sectional Study

COVID-19 Pandemisinde Diş Hekimlerinin Anksiyetesi ve Psikolojik Dayanıklılığı: Kesitsel Bir Çalışma

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Abstract

Objective: Healthcare workers are at risk of psychological disorders as a consequence of the COVID-19 pandemic. The aim of this study was to determine the COVID-19-related anxiety level and psychological resilience of dentists who had provided healthcare interventions in Turkey during the pandemic.

Materials and Methods: A total of 391 volunteers were enrolled to be literate in Turkish and to have worked at least 1 year before and during the pandemic. Data collection form was bodied in 3 parts. While the demographic questions such as age, gender, etc., was at first part, the other parts consisted of the Coronavirus Anxiety Scale (CAS) and the Brief Resilience Scale (BRS), respectively. Statistical significance was set at p<0.05.

Results: The 57.5% of the participants were female. The CAS mean of the dentists working in public hospitals was higher than working in their own offices(p<0.05). The mean BRS of the participants with duration in profession between 10 and 15 years was the lowets among all subgroups (p<0.05). Comparison of mean CAS and BRS values of participants regarding with their speciality showed that surgeons, pedodontists and orthodontists had low CAS mean values (p<0.05), whereas BRS levels of these specialities significantly higher (p<0.05). There was a negative association between CAS levels and BRS levels (r=-.145, p<0.01).

Conclusion: The results obtained within the limitations of the study can be interpreted as psychological resilience may be an important factor to prevent the development of anxiety in dentists who worked as forefronted in challenging conditions such as the COVID-19 pandemic.

Keywords: anxiety; coronavirus; dentists; psychological resilience; occupational disease

ÖZ

Amaç: Sağlık çalışanları, COVID-19 pandemisiyle ilişkili psikolojik bozukluklar açısından risk altındadır. Bu çalışmanın amacı, pandemi döneminde Türkiye'de sağlık hizmeti veren diş hekimlerinin COVID-19 ile ilgili kaygı düzeylerini ve psikolojik sağlamlıklarını belirlemektir.

Gereç ve Yöntemler: Pandemi öncesinde en az 1 yıl çalışmış, pandemi sırasında çalışmaya devam eden ve Türkçe okuryazar olan toplam 391 gönüllü çalışmaya katıldı. Çalışamda kullanılan veri toplama formu 3 bölümden oluşmaktadır. İlk bölümde yaş, cinsiyet vb. demografik sorular yer alırken, diğer bölümlerde sırasıyla Koronavirüs Anksiyete Ölçeği (KAS) ve Kısa Dayanıklılık Ölçeği (KDÖ) yer aldı. İstatistiksel anlamlılık p<0.05 düzeyinde değerlendirildi.

Bulgular: Katılımcıların %57,5'i kadındı. Devlet hastanelerinde çalışan diş hekimlerinin KAS ortalamaları kendi muayenehanelerinde çalışan diş hekimlerinden daha yüksekti (p<0.05). Meslekte geçirdiği süre 10 ile 15 yıl arasında olan katılımcıların ortalama KDÖ'sü tüm alt gruplar arasında en düşüktü (p<0.05). Katılımcıların uzmanlık alanlarına göre ortalama KAS ve KDÖ değerleri karşılaştırıldığında, cerrahların, pedodontistlerin ve ortodontistlerin KAS ortalama değerlerinin düşük (p<0.05), bu uzmanlıkların KDÖ değerlerinin anlamlı olarak yüksek olduğu (p<0.05) görüldü. KAS ile KDÖ arasında negatif yönlü zayıf bir ilişki saptandı. (r=-.145, p<0.01).

Sonuç: Çalışmanın limitasyonları dahilinde elde edilen sonuçlar, COVID-19 pandemisi gibi zor çalışma koşullarında ön planda çalışan diş hekimlerinde anksiyetenin önlenmesinde psikolojik dayanıklılığın önemli bir faktör olabileceğine işaret etmektedir.

Anahtar Kelimeler: diş hekimleri; kaygı; koronavirüs; meslek hastalığı; psikolojik dayanıklılık

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INTRODUCTION

The Coronavirus Disease 2019 (COVID-19) pandemic, which originated in Wuhan City, Hubei Province, China in 2019, has had a tremendous and far-reaching effect on the global population. Coronavirus primarily spreads through droplets and can cause serious, life-threatening symptoms such as organ failure, severe pneumonia, and acute respiratory distress syndrome in some patients (Serafim et al., 2021). In addition, the pandemic has had a significant psychological impact on individuals worldwide, and numerous studies have been conducted to better understand its psychological effects.

Dentists are particularly vulnerable to contracting COVID-19 due to their use of high-speed and water-based instruments that generate aerosols, direct and indirect contact with saliva and blood, and close proximity to patients during procedures (Ge et al., 2020). This increased risk was linked to fear, stress, anxiety, and depression in dentists (Ahmed et al., 2020;Atay et al., 2020;Gasparro et al., 2020;Shacham et al., 2020). Furthermore, healthcare workers not consisted of dentists reported higher levels of anxiety during the pandemic than in other segments of society, and consequently, anxiety disorder, post-traumatic stress disorder, major depression, and alcohol use disorder increased dramatically (Tengilimoğlu et al., 2021). Therefore, it is of paramount importance to explore the psychological resilience of dentists to equip them specifically with the necessary strategies to cope with the challenges posed by the COVID-19 pandemic. Research in this area may help improve the mental health and well-being of dentists, as well as other healthcare professionals, and allow them to better serve their patients during this difficult period.

The aim of this study was to explore the anxiety and psychological resilience of dentists during the COVID-19 pandemic in relation to their demographic characteristics and to test the null hypothesis that demographic factors do not affect dentists' levels of COVID–19 anxiety and psychological resilience. To achieve this, a cross-sectional survey was conducted to measure the psychological resilience of a sample of dentists by assessing their levels of anxiety and stress as well as their coping strategies. The results of the study were used to identify any potential gaps in the current support and educational resources available to dentists to ensure that they have the skills and knowledge needed to effectively manage their anxiety and stress during the pandemic.

MATERIALS AND METHODS

Study Design, Sample Size, and Participants

This cross-sectional, survey-based study was approved by the Istanbul Aydin University Non-Interventional Research Ethics Committee on February 3, 2021 (Ethics Committee No. 2021/374). It was conducted on 391 participants between December 15, 2021, and March 15, 2022. It was designed to gain an in-depth understanding of the current views, attitudes, and behaviors of actively working dentists in Turkey, and a power analysis was used to determine the sample size of the study. This power analysis was conducted using a population of 43,199 registered, actively working dentists in Turkey as the basis, and the G-Power 3.1 program determined the sample size to be 360. An effect size of 0.20, power of 85%, and alpha margin of error of 0.05 were also considered during the power analysis.

The inclusion criteria for this study were literacy in Turkish, having at least one year of experience as a dentist prior to the COVID-19 pandemic, providing healthcare services during the COVID–19 pandemic, being willing to volunteer, and being a member of the Turkish Dental Association. The exclusion criteria were as follows: not being systemically and psychologically healthy, consuming any kind of medication, over-the-counter remedies and illicit drugs, not answering all questions in the survey, and rescinding their consent during the study period. Considering the inclusion and exclusion criteria, this study was conducted with a total of 391 volunteered participants.

Data Collection

The data collection form for this study consisted of three sections. The first section included sociodemographic questions such as age, gender, type place of employment, speciality in dentistry, and years in the profession.

The second section included the Coronavirus Anxiety Scale (CAS) (Table 1), a one-dimensional 5-point Likert-type scale developed by Lee (Lee, 2020) with a Cronbach's alpha reliability coefficient of 0.93. The Turkish version of the CAS has been validated, and its use in the Turkish context has been confirmed. Furthermore, the scale has been shown to be reliable for measuring anxiety levels (Biçer et al., 2020). The points on the scale range from 0 (not at all) to 4 (almost every day over the last two weeks) (Lee, 2020).

Table 1: Statements of scales

Coronavirus Anxiety Scale (Lee et al., 2020)
St. 1: I felt dizzy, lightheaded, or faint, when I read or listened to news about the coronavirus.
St. 2: I had trouble falling or staying asleep because I was thinking about the coronavirus.
St. 3: I felt paralyzed or frozen when I thought about or was exposed to information about the coronavirus.
St. 4: I lost interest in eating when I thought about or was exposed to information about the coronavirus.
St. 5: I felt nauseous or had stomach problems when I thought about or was exposed to information about the coronavirus.
The Brief Resilience Scale (Smith et al., 2008)
St. 1: I tend to bounce back quickly after hard times.
St. 2: I have a hard time making it through stressful events. (R)
St. 3: It does not take me long to recover from a stressful event.
St. 4: It is hard for me to snap back when something bad happens. (R)
St. 5: I usually come through difficult times with little trouble.
St. 6: I tend to take a long time to get over set-backs in my life. (R)

*St: Statement; **R:** Reverse statement*

The third section included the Brief Resilience Scale (BRS), a one-dimensional 5-point Likert-type scale composed of six items (Table 1) that has been developed (Smith et al., 2008) and validated (Haktanir et al., 2016) for use in Turkish. The BRS evaluates the psychological resilience of participants, with scores ranging from 6 to 30, where a higher score implies more resilience. The BRS evaluates the psychological resilience of participants, with scores ranging from 6 to 30, with higher scores indicating greater resilience.

The data collection tool was administered online via Google Forms, and the shared link was sent to all registered members of the Turkish Dental Association via secure email. To ensure privacy, participants were required to provide informed consent through electronic signatures. To avoid repeated participation, only one of the authors (S.E.M.) had access to the participants' email addresses and the data were securely handled in accordance with ethical and legal standards.

Statistical Analysis

The data were analyzed using the NCSS (Number Cruncher Statistical System) 2007, with descriptive statistical methods (mean, standard deviation, median, frequency, ratio, minimum-maximum values), and the distribution of the data was evaluated through the Shapiro-Wilk Test. The comparison of mean values between two groups was analyzed using the Mann-Whitney U test, whereas the comparison of mean values between more than

two groups was analyzed using the Kruskal-Wallis test. Statistical significance was set at $p < 0.05$.

RESULTS

The mean age of the 391 participants was 36.45 ± 12.67 (ranged 22-69). The all participants, of whom 57.5% (n=225) were female and 53.7% (n=210) were younger than 35 years of age. Dentists employed at private hospitals had the highest representation (45.3 %). Approximately 56.5% of the participants had less than 10 years of professional experience, with dental practitioners comprising about one-third of the population (Table 2).

Table 2: Demographic variables

		N	%
Total		391	100
Age			
	<35	210	53.7
	35-44	82	21.0
	45-54	49	12.5
	55-64	32	8.2
	≥65	18	4.6
Gender			
	Female	225	57.5
	Male	166	42.5
Workplace Type			
	University hospital	128	32.7
	Public hospital	52	13.3
	Private hospital	34	8.7
	Clinic	177	45.3
Speciality			
	DP	135	34.5
	OMS	33	8.4
	OMR	30	7.7
	Pediatric Dentistry	32	8.2
	Endodontics	30	7.7
	Orthodontics	38	9.7
	Periodontology	32	8.2
	Prosthodontics	30	7.7
	Restorative Dentistry	31	7.9

N: *Number; %: Percentage;* **DP:** *Dental Practitioner;* **OMS:** *Oral & Maxillofacial Surgery;* **OMR:** *Oral & Maxillofacial Radiology*

Table 3 presents a comparison of the mean values of the CAS and BRS as they relate to demographic variables. The mean values of CAS and BRS were 3.37 ± 3.23 and 17.57 ± 2.42 respectively. A significant difference was found for all demographic variables in terms of CAS and BRS ($p < 0.05$), except for gender where no significant difference was found ($p > 0.05$).

Table 3: Comparision of questionnare mean score in terms of demographical variables

	CAS		BRS	
	Mean±Sd		Mean±Sd	
Total	3.37±3.23		17.57±2.42	
Gender	Mean±Sd	Median (Min-Max)	Mean±Sd	Median (Min-Max)
F	3.46±3.1	3 (0-5)	17.74±2.13	18 (12-25)
M	3.25±3.3	2 (0-5)	17.35±2.71	17 (10-25)
*p	**0.197**		**0.120**	
Workplace type	Mean±Sd	Median (Min-Max)	Mean±Sd	Median (Min-Max)
University hospital	3.30±2.9	3 (0-5)	17.14±2.32	17 (10-22)
Public hospital	4.15±3.4	4 (0-5)	17.15±3.41	17 (15-25)
Private hospital	4.82±3.4	4 (0-5)	17.82±3.44	17 (12-24)
Clinic	2.91±3.1	3 (0-5)	18.90±3.10	18 (11-25)
*p	**0.002**		**0.021**	
Duration in profession	Mean±Sd	Median (Min-Max)	Mean±Sd	Median (Min-Max)
≤5 y	2.58±2.76	2 (0-5)	18.61±2.59	18 (10-24)
5<y≤10	3.61±2.75	4 (0-5)	17.96±2.03	18 (14-25)
10<y≤15	4.02±3.09	4 (0-5)	16.21±1.96	17 (12-21)
15<y≤20	3.49±3.82	4 (0-5)	17.76±2.36	18 (15-25)
20<y	3.23±3.92	2 (0-5)	17.56±2.81	18 (10-25)
**p	**0.004**		**0.02**	
Speciality	Mean±Sd	Median (Min-Max)	Mean±Sd	Median (Min-Max)
DP	3.04±2.72	3 (0-5)	17.85±2.48	18 (10-25)
OMS	2.39±3.22	2 (0-2)	18.91±1.59	19 (10-23)
OMR	4.15±2.73	4 (0-5)	16.89±1.88	17 (12-20)
Pedodontics	2.84±2.14	2 (0-4)	18.93±2.94	19 (11-25)
Endodontics	4.63±3.09	5 (0-5)	16.93±2.92	17 (10-24)
Orthodontics	3.61±1.32	3 (0-5)	17.18±1.08	17 (14-22)
Periodontics	4.13±2.99	4 (0-5)	17.36±2.90	17 (14-22)
Prosthodontists	4.37±3.49	5 (0-5)	17.06±2.23	17(14-23)
Restorative dentistry	4.48±3.35	4 (0-5)	16.84±1.53	17 (15-20)
**p	**0.001**		**0.001**	

CAS: Coronavirus Anxiety Scale; BRS: The Brief Resilience Scale; F: female; M: male; y: year; DP: Dental Practitioner; OMS: Oral & Maxillofacial Surgery; OMR: Oral & Maxillofacial Radiology; Mean±Sd: Mean±Standard deviation; Min-Max: minimum-maximum values;*Mann-Whitney U Test, **Kruskal-Wallis Test, p<0.05

The CAS scores of dentists working in both public and private hospitals were higher than those of dentists working in their own clinics (p<0.001). Dentists employed in a university hospital setting had lower CAS scores than those

working in both private (p<0.001) and public hospitals (p<0.001); those with 5 years or less of professional experience had lower CAS scores than other age groups (p<0.001) Oral and maxillofacial surgeons and specialists in pedodontics had lower CAS scores than those of other participants (for both, p<0.001) without any difference between them (p>0.05).

The mean BRS scores of participants who worked in public hospitals and university hospitals were significantly lower than those of participants who worked in private clinics or in practice (p<0.001). Dentists with 5 or fewer years of professional experience had higher mean BRS scores than those with 6–10 and 11–15 years of professional experience (p<0.001). In addition, the mean BRS scores of oral and maxillofacial surgeons and specialists in pedodontics were significantly higher than those of other participants (p<0.001).

Considering the correlation analyses as shown in Table 4, a negative association between CAS levels and BRS levels was observed (p<0.05)

Table 4: Correlation analysis

		CAS	BRS
CAS	r	1	**-.145***
	p	.	.000
BRS	r	**-.145***	1
	p	.000	.

CAS: Coronavirus Anxiety Scale; BRS: The Brief Resilience Scale; *Spearman's correlation coefficent (r) is significant at p<0.05 level.

DISCUSSION

This cross-sectional study aimed to assess the impact of demographic features on the levels of anxiety and psychological resilience of dentists during the COVID–19 pandemic. The results indicated that demographic features had an impact on the levels of anxiety and psychological resilience, apart from gender. Additionally, a negative and very weak relationship was observed between anxiety levels and psychological resilience. These findings provide valuable insights into the anxiety and psychological resilience levels of dentists during the pandemic. Therefore, the outcomes supports the assumption that there is a negative relationship between anxiety and psychological resilience in healthcare professionals including dentists, during traumatic

events like the COVID–19 pandemic. Considering all, the null hypothesis of the study was rejected.

Psychological resilience is an important factor in the ability of individuals to withstand traumatic events such as the COVID–19 pandemic. Several studies have suggested a negative relationship between anxiety levels and psychological resilience in healthcare professionals (Huffman et al., 2021;Lin et al., 2020;Mosheva et al., 2020). During the COVID–19 pandemic, healthcare workers apart from dentists have been found to have a higher psychosocial impact than the general population (Biçer et al., 2020;Horesh et al., 2020;Lai et al., 2020;Lee, 2020;Lin et al., 2020;Smith et al., 2021). Dentists are particularly vulnerable to anxiety owing to their high exposure to saliva and aerosols, which are some of the most significant transmission routes for the coronavirus (Pappa et al., 2020;Peng et al., 2020). Consequently, compliance with infection control protocols has become essential for dentists during the pandemic.

Younger dentists who have just started their careers are often more conscious and sensitive to infection control protocols, which can lead to increased anxiety (Sağlam and Saruhan, 2021). Similarly, one study found that dentists with less professional experience had higher levels of anxiety (Sağlam and Saruhan, 2021). The study also found that younger dentists had higher levels of anxiety than middle-aged dentists, while dentists over 50 years of age had the highest levels of anxiety (Jungmann and Witthöft, 2020;Majeed et al., 2021). The study found that dentists who had worked for 0-10 years in the profession had higher levels of psychological resilience than those who had worked for 11-15 years. On the other hand, different studies have shown that with increasing experience in the profession, stress and contamination anxiety decrease (Arslan et al., 2021;Gooding et al., 2012;Majeed et al., 2021). Although biological age and duration in profession are not the same variables, the findings of these variables were found to be parallel in our study population. Since this study was designed specifically for a professional occupational group, the findings were evaluated in terms of duration in profession variable instead of biological age. Our study results are consistent with previous studies (Majeed et al., 2021) which found that dentists with 16 years or more of professional experience had higher psychological resilience levels than those with 11-15 years of experience. Despite their increased risk of health problems and systemic disorders, dentists with more experienced time in the profession have higher levels of psychological resilience, which can be attributed to their

sensitivity to infection control, better problem-solving skills, and proactive measures to protect themselves from COVID-19.

Although no study was found to compare, the findings revealed anxiety levels of dental practitioners, oral and maxillofacial surgeons, pedodontists, and orthodontists were significantly lower than remained other specialities. However the outcomes could be attributed that lower risk of COVID-19 transmission from children in terms of pedodontists, emergency treatments and treatments with high risk of transmission are not routinely applied by orthodontists, thanks to nature of speciality the idea that surgeons have already pay attention to the use of personal protective equipment before pandemic.The extensive working hours, improper work schedules, and increased workloads of healthcare professionals who continue to provide medical services at the frontlines of the pandemic, along with increased exposure to COVID-19 patients, can trigger psychological distress (Horesh et al., 2020). Studies on physicians have found that those who provide more than 8 hours of healthcare experience have increased emotional exhaustion (Horesh et al., 2020). Similarly, stress, emotional exhaustion, and depersonalization significantly increased among those who worked for 9 hours or more (Li et al., 2020;Lin et al., 2020). The long hours spent working in dental clinics, insufficient distance during dental procedures, and the presence of bio-particles suspended in the air for an extended time can also contribute to COVID-19 and other infectious diseases (Horesh et al., 2020).

The study also found that workplace type can impact the emotional well-being of healthcare workers. A study that assessed the stress levels of physicians in relation to their workplace found no relationship between the type of workplace and stress or anxiety (Kulu and Özsoy, 2021). However, our results showed that dentists working in public hospitals had higher anxiety levels and lower psychological resilience than participants working in private hospitals had . This can be attributed to the fact that dentists in private clinics had more control over their work schedules and less contact with patients during the pandemic, which may have provided a more conducive environment for maintaining psychological resilience and reducing anxiety.

Dentists during the COVID-19 pandemic may experience fear of infection as well as anxiety due to factors such as flexible work hours, increased workload, exposure to COVID–19 positive patients, lack of physical distancing during dental procedures, and long hours of work. Workplace

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type can also have an impact, with dentists working in public hospitals exhibiting higher levels of anxiety and lower levels of psychological resilience than those working in private clinics.

The current study has several limitations, such as not taking into account the participants' anxiety and psychological resilience levels prior to the pandemic, as well as other potential factors that may have contributed to their mental health, such as working conditions or economic status. This could potentially lead to incomplete assessment of the impact of the pandemic on the mental health of dentists, and it is important to consider these aspects to gain a full understanding. Additionally, the study was conducted in a single geographic area, which may have limited the applicability of the findings to other regions. Future studies should consider the potential impact of such factors and extend the research to other areas to provide a more comprehensive understanding of the effects of the COVID–19 pandemic on the mental health of dentists. It is also necessary to gain insight into the psychological resilience of dentists during this difficult period and their need for improved mental health services. Therefore, future studies should comprehensively assess the impact of the pandemic on dentists' mental health and focus the mental health promotion strategies.

CONCLUSION

The results of our study suggest a positive correlation between high psychological resilience and low anxiety among dentists during the COVID–19 pandemic. Specifically, dentists who work in their own practices, have 1–10 years of experience, or have more than 16 years of experience showed low levels of anxiety and high levels of psychological resilience. These findings indicate that improved working conditions and comprehensive psychological support may be instrumental in helping to reduce anxiety and strengthen psychological resilience among healthcare workers, who are essential to providing services to their communities. Therefore; it is vital to ensure that healthcare workers have access to the resources and support they need to maintain and protect their mental health and well-being. Moreover, further research should be conducted to explore how different gender, age, and cultural backgrounds affect psychological resilience and ways to promote psychological well-being among healthcare workers. This could include exploring the role of different policies and procedures, such as national and international guidelines, in promoting and preserving the mental health of healthcare workers. Additionally, it would be beneficial to investigate how access to resources and support, as well as work-life balance, can play a role in mediating levels of anxiety and psychological resilience among dentists. Such research could help guide the development of strategies to support the mental health of healthcare workers and promote their psychological well-being.

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