

Evaluation of dentists' stress and anxiety levels in the COVID-19 pandemic

Fatma Uçan Yarkaç¹, Ümmühan Tekin Atay¹, Nisa Nur Dinçer¹, Elif Öncü⁴

¹ Necmettin Erbakan University, Faculty of Dentistry, Department of Periodontology, Konya, Turkey

² Lokman Hekim University, Faculty of Dentistry, Department of Periodontology, Konya, Turkey

Abstract

Aim: Coronavirus disease 2019 (COVID-19) can cause stress, anxiety, and fear, especially in healthcare workers as it has a high risk of transmission. The aim of this study was to investigate the levels of stress and anxiety during the COVID-19 pandemic among dentists working in our country.

Methodology: The study included 164 dentists. Sociodemographic data and the stress and anxiety levels of the individuals who participated in the study were recorded. The COVID-19 Stress Scale and the Perceived Stress Scale-10 were used for evaluation of the stress levels, and the Generalized Anxiety Disorder 7 was used to evaluate the anxiety levels. All data were considered statistically significant at $p < 0.05$.

Results: Among those who participated in the study, 112 were women and 52 were men, and 50% of them were 20 to 30 years of age. Based on the information these dentists provided, 63% did not have any expertise and 66% had worked in the normalization process. Their scores in the COVID-19 Stress Scale, the Generalized Anxiety Disorder Scale 7, and Perceived Stress Scale-10 were 64.4 ± 25.2 , 5.46 ± 4.8 , and 18.8 ± 5.9 , respectively, and there was a positive correlation between all scales. When evaluating the stress levels according to gender, it was observed that those of the female dentists were higher than those of the male dentists ($p < 0.05$). There was no significant difference in the anxiety levels between the male and female dentists. While there were no significant differences between the dentists who worked during the pandemic process and those who did not work ($p > 0.05$), the COVID-19 stress levels were found to be lower in the normalization process ($p < 0.05$).

Conclusion: The COVID-19 pandemic has caused stress and anxiety in dentists and has affected female dentists more than male dentists. In addition, working during the pandemic process can benefit dentists by helping to reduce the stress caused by the pandemic.

Keywords: anxiety, stress, coronavirus, stress scale, dentists

Correspondence:

Dr. Ümmühan TEKİN ATAY

Necmettin Erbakan University,
Faculty of Dentistry, Department
of Periodontology, Konya, Turkey.
E-mail: dtummuhan@gmail.com

Received: 11 March 2021

Accepted: 18 May 2021

Access Online



DOI:

10.5577/intdentres.2021.vol11.suppl1.38

How to cite this article: Uçan Yarkaç F, Tekin Atay Ü, Dinçer NN, Öncü E, Evaluation of dentists' stress and anxiety levels in the COVID-19 pandemic. Int Dent Res 2021;11(Suppl.1):259-65. <https://doi.org/10.5577/intdentres.2021.vol11.suppl1.38>

Introduction

In recent years, three coronaviruses have crossed from animal species and transmitted disease to humans, causing outbreaks of large-scale pandemics (1,

2). Among these viral zoonotic pathogens were severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome-related coronavirus (MERS-CoV), both of which can cause respiratory diseases in humans. An outbreak of a form of pneumonia resulting from a new coronavirus (SARS-

CoV2, which causes COVID-19) began in December 2019 in Wuhan, China (3-5). COVID-19 then spread rapidly throughout the world (6).

In our country, the first coronavirus case was seen in March 2020, and a significant increase in the numbers of cases and deaths were observed in the days that followed (7, 8).

This novel virus causes an acute and deadly disease and leads to increases in mortality rates. The rise in the numbers of deaths due to COVID-19 has greatly increased the prevalence of fear, anxiety, and depression in healthcare professionals and the general population (9). The results of a survey study conducted in 2020 by Wang et al. on Chinese people reported that COVID-19 caused psychological effects that were moderate to high in severity among 53.8% of the participants (10). In addition to the psychological effects that COVID-19 had on the general population, the fear among healthcare workers of being infected with the virus while treating patients who had already been infected with it and of then infecting their own families and loved ones has caused them to experience even greater stress. Dentists are at the top of the list of professions that have a high risk of contamination, because of the intense aerosol and airborne particles to which they are exposed during dental therapy. Dentists have been confronted with more psychological problems such as stress, anxiety, and depression because they have a particularly high risk of becoming infected by patients and potentially transmitting the virus to their peers, families, and other patients (11).

In previous epidemics that have taken place throughout the world, psychological effects such as somatization, depression, anxiety, and hostility toward the outside world were reported in about 10% of healthcare workers (12). A study from Taiwan that researched stress responses among the healthcare workers reported that 20% felt stigmatized, and 5% suffered from acute stress disorders. In addition, another study found that 9% of the hospital staff had considered resignation and declared their reluctance to work during the SARS epidemic (13). More recently, the prevalence of stress-related symptoms, anxiety, and depression were found to be 73.4%, 44.7%, and 50.7%, respectively, among hospital staff during the COVID-19 pandemic (14). A recent study in our country also showed that the COVID-19 pandemic causes anxiety and fear. In addition, postgraduate dentistry students reported high scores with regard to fear in relation to COVID-19 (15). The purpose of this study, then, was to research the stress and anxiety levels that dentists in our country felt as a result of the COVID-19 pandemic.

Materials and Methods

The study protocol was approved by the Ethics Committee of the Necmettin Erbakan University Faculty of Dentistry (2020/02-09) and was carried out in accordance with the instructions of the Declaration of Helsinki. The information about the purpose, content, and procedures of the study was provided in an online form, and online written consent was taken

from all the participants. In total, 164 dentists were included in the study. The study sample contained 112 women (68.3%) and 52 men (31.7%). The mean age was ranged from 20 to 60 years.

A Google form was created and circulated on different online platforms. The information about the study's purpose, content, and procedures was provided in the online form and approved by the participants. Sociodemographic data and the stress and anxiety levels of the individuals who participated in the study were recorded. The sociodemographic data included the marital statuses, ages, and genders of the participants. The COVID-19 Stress Scale (CSS) and Perceived Stress Scale (PSS)-10 were used for evaluation of the stress levels, and the Generalized Anxiety Disorder (GAD)-7 was used for evaluation of the anxiety level.

COVID-19 Stress Scale

The study used the COVID-19 Stress Scale (CSS) that was developed by Taylor et al. to measure the stress levels of individuals during the COVID-19 pandemic (16). The answer to each question in the CSS, which is a Likert-type scale that includes 36 questions from the participants, consists of five possible scores ranging from 0 (Never) to 4 (Always). The total score classified the stress levels as follows: less than 5 as low stress, 5 to 16 as mild stress, 17 to 36 as moderate stress, 31 to 71 as high stress, and ≥ 71 as severe stress.

PSS-10

Perceived Stress Scale-10 is designed to measure how certain stressful situations in a person's life are perceived (17). The test-retest reliability coefficient of the Turkish PSS-10 was 0.886, and internal consistency coefficient was 0.82. PSS-10, comprising 10 items, consisted of descriptive terms of stress symptoms rated by the subject on a 4-point scale, ranging from "Never (0)" to "Very often (4)". The total score classified the stress density levels: less than 9, low stress; 9 to 16, moderate stress; and ≥ 16 , high stress.

GAD-7

The Generalized Anxiety Disorder (GAD-7) scale, a self-report anxiety scale comprising 7 items, is a highly reliable scale (Cronbach's $\alpha = 0.85$) in the Turkish population. The answer to each question in the GAD-7, is rated on a 4-point scale. The total score ranges from 0 to 21 classified the anxiety levels: less than 4, absence of anxiety; 5 to 9, mild anxiety level; 10 to 14, moderate anxiety level, and ≥ 15 severe anxiety level (18).

Statistical analysis

Data analysis was undertaken using the SPSS software version 21.0 (IBM SPSS Inc., Armonk, NY, USA). The scales used in the study were tested with exploratory factor analysis and reliability analysis for

data analysis. For the sociodemographic data and categorical data were assessed using the χ^2 test. Correlation analysis and chi-square analysis were performed the analysis of the variables.

Results

A total of 162 dentistry (112 women and 52 men) were asked to participate in the survey. Sociodemographic characteristics of the participants are presented in Table 1. The ages of the participants were 18 to 60 years. 76 participants were married and had a child. There observed that 63% of participants have no expertise in dentistry. One hundred seven participants (65.2%) worked in dental clinics. Others worked in dental centers (6.7%) and universities (28%). The vast majority of participants (66.5%) were studied during the restriction process, 87.2% of participants were studied during the normalization process in the pandemic. In addition, 53.4% of dentists made the routine dental applications in the normalization process in the pandemic.

Amongst this, 40.9% of participants had a low-stress level, 16.5% had moderate stress, and 42.7% suffered from severe stress levels, as shown in Table 2. The total CSS of participants was 64.4 ± 25.2 . There was a statistically difference between the male and female individuals (χ^2 : 11.901, p : 0.002), and female dentists were more stress levels compared to men ($p < 0.05$). There were no differences in CSS levels between working and non-working dentists during the restriction process of the pandemic χ^2 : 3.464, p : 0.177) (Table 3),

however, CSS levels were found to be lower working dentists during the normalization process (χ^2 : 9.517, p : 0.009) (Table 4).

6.7% of participants had low perceived stress levels, 16.5% had moderate perceived stress, and 76.8% suffered from high perceived stress levels, as shown in Table 5. Total PSS-10 scores of participants were 18.8 ± 5.9 . There was a statistically difference between the male and female individuals (χ^2 : 16.091, p : 0.001). In females, the high perceived stress level was 83.9%; however, the high perceived stress level was 61.5% for men ($p < 0.05$). There were no differences in COVID-19 stress levels between working and non-working dentists during the restriction and normalization process of the pandemic ($p > 0.05$).

Total GAD-7 scores of participants were 5.46 ± 4.8 . 47% of participants had mild anxiety, 34.1% had moderate anxiety, 12.2% suffered from high anxiety, and 6.7% severe anxiety, as shown in Table 6. There was no statistical difference between the male and female individuals (χ^2 : 6.810, p : 0.078). In females, the high and severe anxiety level was 21.3%; however, the high perceived stress level was 11.5% for men ($p < 0.05$). There were no differences in COVID-19 stress levels between working and non-working dentists during the restriction and normalization process of the pandemic (χ^2 : 1.304, p : 0.728).

There is a statistically significant positive relationship between the CSS, PSS-10, and GAD-7 ($p < 0.05$) (Table 7). As presented in Table 8; internal consistency and the mean scores for CSS, PSS-10, and GAD-7. Cronbach's alpha values of CSS, PSS-10 and GAD-7 were 0.938, 0.915 and 0.748, respectively.

Table 1. Socio-demographics characteristics of individuals

		N	%
Gender	Male	52	31,7
	Female	112	68,3
Age	20-30 years	82	50,0
	31-40 years	34	20,7
	41-50 years	19	11,6
	51-60 years	17	10,4
	>60 years	12	7,3
Marital Status	Unmarried	88	53,7
	Married	76	46,3
Chronic disease	No	148	90,2
	Yes	16	9,8
Child Ownership	No	100	61,0
	Yes	64	39,0
Living with Family	No	53	32,3
	Yes	111	67,7

Table 2. Comparison of COVID-19 stress scale levels of individuals

			COVID-19 Stress			Total	x2	p
			Low	Moderate	Severe			
Gender	Male	n	13	15	24	52		
		%	25,0%	28,8%	46,2%	100,0%		
	Female	n	54	12	46	112		
		%	48,2%	10,7%	41,1%	100,0%		
Total			n	67	27	70	164	
			%	40,9%	16,5%	42,7%	100,0%	

Table 3. Comparison of generalized anxiety disorder levels by employment status in restriction

			CSS			Total	x2	p
			Mild	Moderate	Serious			
Employment Status in Restriction	No	n	19	7	29	55		
		%	34,5%	12,7%	52,7%	100,0%		
	Yes	n	48	20	41	109		
		%	44,0%	18,3%	37,6%	100,0%		
Total			n	67	27	70	164	
			%	40,9%	16,5%	42,7%	100,0%	

Table 4. Comparison of COVID-19 stress levels by working status in the normalization process

			CSS			Total	x2	p
			Mild	Moderate	Serious			
Working Status in Normalization Process	No	n	6	0	15	21		
		%	28,6%	0,0%	71,4%	100,0%		
	Yes	n	61	27	55	143		
		%	42,7%	18,9%	38,5%	100,0%		
Total			67	27	70	164	9,517	0,009
			%	40,9%	16,5%	42,7%	100,0%	

Table 5. Comparison of perceived stress scale-10 levels of individuals

			Perceived Stress			Total	x2	p
			Low	Moderate	Severe			
Gender	Male	n	9	11	32	52		
		%	17,3%	21,2%	61,5%	100,0%		
	Female	n	2	16	94	112		
		%	1,8%	14,3%	83,9%	100,0%		
Total			11	27	126	164	16,091	0,001*
		%	6,7%	16,5%	76,8%	100,0%		

Table 6. Comparison of generalized anxiety disorder-7 scales levels of individuals

			Generalized Anxiety Disorder				Total	x2	p
			Mild	Moderate	High	Severe			
Gender	Male	n	32	14	4	2	52	6,81	0,078
		%	61,5%	26,9%	7,7%	3,8%	100,0%		
	Female	n	45	42	16	9	112		
		%	40,2%	37,5%	14,3%	8,0%	100,0%		
Total		77	56	20	11	164			
	%	47,0%	34,1%	12,2%	6,7%	100,0%			

Table 7. Correlations of the COVID-19 stress scale, perceived stress scale -10 and generalized anxiety disorder-7 scales

	COVID-19 Stress Scale	Perceived Stress Scale -10	Generalized Anxiety Disorder-7
COVID-19 Stress Scales	1	,316**	,474**
Perceived Stress Scale -10		1	,584**
Generalized Anxiety Disorder-7			1

Table 8. Internal consistency and the mean scores for COVID-19 stress scale, perceived stress scale -10, and generalized anxiety disorder-7 scales

	Mean scores	Internal consistency
COVID-19 Stress Scale	64.4±25.2	0.938
Perceived Stress Scale -10	18.8±5.9	0.915
Generalized Anxiety Disorder-7	5.46±4.8	0.748

Discussion

Considering the history of the world, fear and stress are strong emotions that are frequently encountered during the epidemic period. Especially during pandemic periods, healthcare workers face more psychological problems such as stress and anxiety compared to the general public. It is thought that fear and anxiety increase in dentists who are heavily exposed to saliva and aerosol, which is one of the most important transmission routes of coronavirus. In this study, the working status of dentists during the pandemic process and the impacts of the pandemic on the stress and anxiety levels of dentists were evaluated. The results showed that the COVID-19 pandemic causes stress and anxiety in dentists, and it is seen that this situation affects female dentists more than male dentists. In addition, working during the pandemic process can benefit dentists from less stress caused by the pandemic.

The females had more sensitive to stress factors and were confronted with more stressors compared to males. A study conducted with 204 participants in Israel evaluated the psychological risk factors in the COVID-19 process and suggested that being a woman, living alone and having chronic disease are important risk factors (19). A cross-sectional survey study of a sample consisting of 367 students from Saudi Arabia evaluated sociodemographic characteristics, PSS and their emotions and concerns during the pandemic and concluded that a significant difference between male and female university student's level of stress (20). Elbay et al. investigated the psychological responses of healthcare workers and related factors by online survey during the COVID-19 outbreak. According to their study, being male, older, having more work experience associated with lower scores (21). Similar results were reported in previous survey studies (19-25). In our study, the female dentists reported significantly higher levels of stress and anxiety compared to male dentists. Also, studies showed a positive correlation between anxiety and stress levels, which is similar to our research results (26, 27).

Many studies have been researched on the mental health of individuals during situations such as isolation, lockdown, and quarantine to prevent the spread of pandemics (28). These studies reported that when individuals are restricted to a certain kind of environment, their mental health gets adversely affected. Stress, anxiety and depression may be viewed as normal emotional reactions in the face of a pandemic. Healthcare workers in previous pandemics have experienced high levels of stress, anxiety and low mood, with negative psychological impacts (6, 29, 30).

The results of a study investigating the anxiety of surgical assistant doctors of being infected with the COVID-19 virus reported that assistants with less working hours had higher anxiety of being infected with the COVID-19 virus. However, it was observed that assistant doctors had higher GAD-7 scores (≥ 10) compared to trainee students (31). Another study investigated depression, stress, and anxiety levels of physicians during the COVID-19 outbreak and reported

that being male, older, and having more work experience were associated with lower depression, stress, and anxiety scores (21). In our study, there was showed that dentists have high-stress level and moderate anxiety level. In addition, our study observed that there was no significant difference between working and non-working dentists in the period of restrictions on CSS, PSS-10, and GAD-7 scales. This can be due to their ability to adapt to crises. It can also be because the survey was done after the early parts of the pandemic when cases were low, and the health care system was not engulfed (32).

To our knowledge, this study was the first one to evaluate the CSS that has been surveying dentists after its development. Our study showed a high COVID-19 stress level in dentists; moreover, CSS showed a positive correlation with PSS-10 and GAD-7.

Conclusions

Pandemic can cause mood changes such as anxiety and stress that negatively affect life in individuals. In dentists, there is also an increase in anxiety and stress levels caused by the pandemic in the high-risk group. The results of our study show that COVID-19 particularly affects female dentists more and causes more stress for female physicians than male physicians. In addition, working during the pandemic process can benefit dentists from less stress caused by the pandemic.

Acknowledgments: This study was presented as a full-text oral presentation at the 1st International Dental Research and Health Sciences Congress held between 20-22 May 2021.

Ethical Approval: Ethics committee approval was received for this study from Necmettin Erbakan University, Faculty of Dentistry in accordance the World Medical Association Declaration of Helsinki, with the approval number: 2020/02-09

Peer-review: Externally peer-reviewed.

Author Contributions: Conception - F.U.Y.; Design - Ü.T.A.; Supervision - N.N.D.; Materials - E.Ö.; Data Collection and/or Processing - F.U.Y.; Analysis and/or Interpretation - Ü.T.A.; Literature Review - N.N.D.; Writer - E.Ö.; Critical Review - F.U.Y.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

References

1. Perlman S. Another Decade, Another Coronavirus. *N Engl J Med*. 2020;20:382(8):760-762. ([Crossref](#))
2. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. *Lancet*. 2020;15:395(10223):470-73. ([Crossref](#))
3. Cui J, Li F, Shi ZL. Origin and evolution of pathogenic coronaviruses. *Nat Rev Microbiol*. 2019;17(3):181-92. ([Crossref](#))

4. de Wit E, van Doremalen N, Falzarano D, Munster VJ. SARS and MERS: recent insights into emerging coronaviruses. *Nat Rev Microbiol*. 2016;14(8):523-34. ([Crossref](#))
5. Luk HKH, Li X, Fung J, Lau SKP, Woo PCY. Molecular epidemiology, evolution and phylogeny of SARS coronavirus. *Infect Genet Evol*. 2019;71:21-30. ([Crossref](#))
6. Chan JF, Yuan S, Kok KH, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. *Lancet*. 2020;395(10223):514-23. ([Crossref](#))
7. de Groot RJ, Baker SC, Baric RS, et al. Middle East respiratory syndrome coronavirus (MERS-CoV): announcement of the Coronavirus Study Group. *J Virol*. 2013;87(14):7790-2. ([Crossref](#))
8. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 2020;395(10223):497-506. ([Crossref](#))
9. Liu S, Yang L, Zhang C, et al. Online mental health services in China during the COVID-19 outbreak. *Lancet Psychiatry*. 2020;7(4):e17-e18. ([Crossref](#))
10. Wang D, Hu B, Hu C, et al. Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China. *JAMA*. 2020;323(11):1061-9. ([Crossref](#))
11. Zhonghua Jie He He Hu Xi Za Zhi. Group of Interventional Respiratory Medicine, Chinese Thoracic Society. (Expert consensus for bronchoscopy during the epidemic of 2019 novel coronavirus infection (Trial version)). 2020;43(3):199-202.
12. Al Wattar B, Tamilselvan K, Khan R, Kelso A, Sinha A, Pirie AM. 2. Classification and diagnosis of diabetes. *Diabetes Care*. 2017; 40(1):S11-S24. ([Crossref](#))
13. Bai Y, Lin CC, Lin CY, Chen JY, Chue CM, Chou P. Survey of stress reactions among health care workers involved with the SARS outbreak. *Psychiatr Serv*. 2004;55(9):1055-7. ([Crossref](#))
14. Lai J, Ma S, Wang Y, et al. Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. *JAMA Netw Open*. 2020;3(3):e203976. ([Crossref](#))
15. Atay ÜT, Dincer NN, Yarka FU, Oncu E. Covid-19 Pandemi Sürecinde Diş Hekimliği Uzmanlık Öğrencilerinin Korku ve Anksiyete Düzeylerinin Değerlendirilmesi. *NEU Dent J* 2020 2(3): 86-93. ([Crossref](#))
16. Taylor S, Landry CA, Paluszek MM, Fergus TA, McKay D, Asmundson GJG. Development and initial validation of the COVID Stress Scales. *J Anxiety Disord*. 2020;72:102232. ([Crossref](#))
17. Cohen S, Kamarck T, Mermelstein R. Perceived stress scale. *Measuring stress: A guide for health and social scientists*, 1994;10:1-2.
18. Löwe B, Decker O, Müller S, et al. Validation and standardization of the Generalized Anxiety Disorder Screener (GAD-7) in the general population. *Med Care*. 2008;46(3):266-74. ([Crossref](#))
19. Horeish D, Kapel Lev-Ari R, Hasson-Ohayon I. Risk factors for psychological distress during the COVID-19 pandemic in Israel: Loneliness, age, gender, and health status play an important role. *Br J Health Psychol*. 2020;25(4):925-33. ([Crossref](#))
20. AlAtteeq DA, Aljhani S, AlEesa D. Perceived stress among students in virtual classrooms during the COVID-19 outbreak in KSA. *J Taibah Univ Med Sci*. 2020;15(5):398-403. ([Crossref](#))
21. Elbay RY, Kurtulmuş A, Arpacioğlu S, Karadere E. Depression, anxiety, stress levels of physicians and associated factors in Covid-19 pandemics. *Psychiatry Res*. 2020;290:113130. ([Crossref](#))
22. Al-Sowaygh ZH. Academic distress, perceived stress and coping strategies among dental students in Saudi Arabia. *Saudi Dent J*. 2013;25(3):97-105. ([Crossref](#))
23. George S, Joseph BB. Level of stress and its causes among 1st year dental students - A cross-sectional study. *Natl J Physiol Pharm Pharmacol* 2018;8(11):1518-1521. ([Crossref](#))
24. Moayedi F, Bastami MM, Ashouri FP, Hamadiyan H, Rasekhi S. Comparison of sources and severity of perceived stress between paramedical and medical students. *Int J Med Res Health Sci* 2016;5(6):183-90.
25. Shah M, Hasan S, Malik S, Sreeramareddy CT. Perceived stress, sources and severity of stress among medical undergraduates in a Pakistani medical school. *BMC Med Educ*. 2010;15:10:2. ([Crossref](#))
26. Khademian F, Delavari S, Koohjani Z, Khademian Z. An investigation of depression, anxiety, and stress and its relating factors during COVID-19 pandemic in Iran. *BMC Public Health*. 2021;21(1):275. ([Crossref](#))
27. Rehman U, Shah Nawaz MG, Khan NH, et al. Depression, Anxiety and Stress Among Indians in Times of Covid-19 Lockdown. *Community Ment Health J*. 2021;57(1):42-8. ([Crossref](#))
28. Ihtesham A, Iqbal A, Khan MS, et al. Psychological Implications of The Late Phase of COVID-19 Pandemic among Medical Undergraduates, Attending Clinical Wards Rotations in Tertiary Care Hospitals of Rawalpindi, Pakistan: An Online Survey-Based Study. *Eur J Med Health Sci* 2020; 2(5). ([Crossref](#))
29. Goulia P, Mantas C, Dimitroula D, Mantis D, Hyphantis T. General hospital staff worries, perceived sufficiency of information and associated psychological distress during the A/H1N1 influenza pandemic. *BMC Infect Dis*. 2010;10:322. ([Crossref](#))
30. McAlonan GM, Lee AM, Cheung V, et al. Immediate and sustained psychological impact of an emerging infectious disease outbreak on health care workers. *Can J Psychiatry*. 2007;52(4):241-7. ([Crossref](#))
31. Collins C, Mahuron K, Bongiovanni T, Lancaster E, Sosa JA, Wick E. Stress and the Surgical Resident in the COVID-19 Pandemic. *J Surg Educ*. 2021;78(2):422-30. ([Crossref](#))
32. Tee ML, Tee CA, Anlacan JP, et al. Psychological impact of COVID-19 pandemic in the Philippines. *J Affect Disord*. 2020;277:379-91. ([Crossref](#))