



# Exploring anxiety levels in healthcare workers during COVID-19 pandemic: Turkey sample

Ceyda Uzun Şahin<sup>1</sup> · Nurşen Kulakaç<sup>2</sup>

Accepted: 8 April 2021 / Published online: 12 May 2021

© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2021

## Abstract

As in the whole world, the Novel Coronavirus (COVID-19) pandemic poses many threats to healthcare workers in our country too, which leads to anxiety in healthcare workers. This study was conducted to explore the anxiety levels of healthcare workers during the COVID-19 pandemic. The study is a cross-sectional study. The population consisted of health care workers employed in hospitals in seven regions in Turkey. All volunteer healthcare workers were included in the study, and 356 healthcare workers responded to the questionnaire. The data were collected using the State Anxiety Inventory and a questionnaire created by the researchers using an online questionnaire between 10 May 2020 and 15 May 2020. In the evaluation of the data, mean, standard deviation, percentages, t-test, one-way ANOVA, Pearson correlation, and multiple regression analysis were used. 33% of healthcare workers did not have anxiety, 50% had mild, and 17% had severe anxiety. The anxiety scores of those who were nurses ( $p < 0.001$ ), who were working in the emergency room ( $p < 0.001$ ), who were involved in treatment for COVID-19 patients ( $p = 0.040$ ), who left their homes to prevent transmission to their families and relatives during the pandemic ( $p = 0.038$ ), and whose working hours had changed ( $p = 0.036$ ) were found to be significantly higher. It was observed that there was a positive and significant relationship between the fear of death and disease transmission, uncertainty, loneliness, anger, and hopelessness, and anxiety levels in healthcare workers. The main factors that significantly affected the anxiety levels of healthcare workers were male gender, weekly working hours, the presence of chronic diseases, and feelings of anger and uncertainty. In conclusion, during the COVID-19 pandemic, healthcare workers experienced some negative emotions, their anxiety levels increased, and they were psychologically affected. Planning psychosocial interventions for healthcare workers in the high-risk group will make significant contributions to the health system.

**Keywords** COVID-19 · Healthcare workers · Anxiety levels of healthcare workers · Questionnaire

## Introduction

The novel Coronavirus (COVID-19) was first identified on January 13, 2020, in the examinations of a group of patients who developed respiratory tract symptoms (fever, cough, shortness of breath) in Wuhan Province in late December. Then, the World Health Organization declared the novel

disease a global pandemic on January 31, 2020 (Lamptey & Serwaa, 2020; Uzun et al., 2020). On December 26, 2020, the Turkish Health Minister announced that the number of healthcare workers infected with COVID-19 surpassed 130,000, and 326 health workers lost their lives in Turkey (Republic of Turkey Ministry of Health, 2020).

After COVID-19 infection gets inside the body, it activates the immune system and causes physical and psychological stress in the body. This stress is associated with factors such as viral, angiotensin, and cytokine load. These stressors are also related to the risk of being infected (Hanscom et al., 2020). Throughout the pandemic, the group at the highest risk of contracting the disease has been frontline healthcare workers struggling with the disease (Tuncay et al., 2020). The literature cites that healthcare workers are under intense pressure during the pandemic due to being in a high-risk group, fear of infecting their families and others, changes in the working hours and system, increased workload, rapidly

✉ Ceyda Uzun Şahin  
ceydam61@gmail.com; ceyda.sahin@erdogan.edu.tr

Nurşen Kulakaç  
nrsnklkc@gmail.com

<sup>1</sup> Department of Vocational School of Health Services, Recep Tayyip Erdogan University, 53000 Rize, Turkey

<sup>2</sup> Health Sciences Faculty, Nursing Department, Gümüşhane University, Gümüşhane, Turkey

changing up-to-date information, isolation, inability to see their family and children, social stigma, fear of death and having to provide care to patients with serious health problems. All these situations during the COVID-19 pandemic can lead to anxiety in healthcare workers (Xiang et al., 2020; Greenberg et al., 2020; Lai et al., 2020; Wong et al., 2005). Evidence shows that healthcare workers struggling with SARS experienced intense anxiety due to the fear and anxiety of transmitting viruses to their family members (Bai et al., 2004; Kisely et al., 2020; Wong et al., 2005). The most common emotions experienced by healthcare workers during epidemics are loneliness, fear, anger, stigma, uncertainty, and hopelessness, which increase their level of anxiety (Kackin et al., 2020; Lee et al., 2018; Maunder et al., 2003; Sun et al., 2020).

Outbreaks are known to have some psychological impacts on healthcare workers. Psychosocial interventions are needed for especially for frontline healthcare workers with high-risk. It is believed that the results of this study on the effect of the COVID-19 pandemic on the anxiety levels of healthcare workers will guide the planning of psychological interventions for healthcare workers. The study was conducted during the COVID-19 to explore the anxiety levels of the health workers in Turkey and associated factors.

## Method

### Participants and Procedure

This study is a descriptive and cross-sectional study. The data were collected between 10 May 2020 and 15 May 2020. The population of the study consisted of health care workers employed in hospitals in seven regions (Marmara, Aegean, Black Sea, Central Anatolia, Eastern Anatolia, Mediterranean, and Southeastern Anatolia) in Turkey. The sample included 385 healthcare workers determined with a 95% confidence interval and 0.05 margin of error. All volunteer healthcare workers were included in the study, and 356 nurses responded to the questionnaire (response rate of 72.46%). Ethical consent was granted by the Human Research Ethics Committee of the local university (2020/5). The participants were informed that they could withdraw from the survey at any moment without providing any justification, and electronic informed consent was obtained from each of them. The study was performed in accordance with the Declaration of Helsinki.

### Instruments

The data of the study were collected using the State Anxiety Inventory and the questionnaire form developed by the researchers. After obtaining the necessary permissions for the

study, an online questionnaire form was prepared with the Google Forms web application and sent to the smartphones of healthcare professionals via WhatsApp, mail, social media (Instagram, Facebook, etc.). The questionnaire form consists of 3 parts and 16 questions. In the first part, there are 9 questions to identify the socio-demographic characteristics of health care workers, the second part includes 6 questions regarding health care workers' experiences in the COVID-19, and the third part includes 1 question related to the emotions experienced most during the COVID-19 outbreak (loneliness, boredom, anger, fear of death, fear of disease transmission, uncertainty, hopelessness, etc.). Access to the survey form is available at [URL] [https://docs.google.com/forms/d/1RhzGt7\\_RpnoJR94dlOPwWpR\\_uTZzY5th9ExCFBf4bzI/edit](https://docs.google.com/forms/d/1RhzGt7_RpnoJR94dlOPwWpR_uTZzY5th9ExCFBf4bzI/edit)

### State Anxiety Inventory (SAI)

The State Anxiety Inventory is a self-assessment survey including short statements to identify state and trait anxiety levels. It was developed by Spielberger and his colleagues in 1970 and adapted for Turkey with the validity and reliability analysis by Öner and Le Compte in 1977 (Öner et al., 1983; Spielberger et al., 1970). The 20-item State Anxiety Inventory and the 20-item Trait Anxiety Inventory are independent of each other. Only the State Anxiety Inventory was utilized in this study. In the State Anxiety Inventory, each item is rated in four Likert type responses as follows: none: 1, a little: 2, a lot: 3, and completely: 4; in the Trait Anxiety Inventory, each item is rated in four Likert type responses: rarely: 1, sometimes: 2, most of the time: 3, and almost always: 4. High scores indicate a high level of anxiety. Cronbach's alpha value was found to be 0.929 in this study.

### Data Analysis

SPSS 20,0 statistical package program was used for statistical analysis. In the evaluation of the data, descriptive statistical methods such as frequency, percentage, mean, standard deviation, as well as the Kolmogorov-Smirnov distribution test were performed to examine the normal distribution. Kurtosis-Skewness values were evaluated between +2 and -2. The comparison of variables showing normal distribution between groups was evaluated using a t-test and one-way ANOVA, the relationship between numerical variables was evaluated using Pearson correlation and multiple regression analysis. Cronbach alpha was used to evaluate the internal consistency of the scales. A *p* value of <0.05 was considered statistically significant.

## Results

The results revealed that the mean age of healthcare workers was  $32.56 \pm 7.30$  years (min: 20; max: 54), 74.6% were females, 61.8% were married, and 42.7% had a bachelor's degree. 85.1% of them did not have a chronic disease, 60.7% were living in a metropolitan city. 59.1% were nurses, 14.5% were physicians, 10.8% were emergency medical technicians, 5.1% were anesthesia technicians, and 4% were cleaning personnel. The remaining 27 participants (10.5%) had 5 different types of professions. 61.8% of healthcare workers had an average of  $48.09 \pm 5.7$  weekly working hours in clinics. 1.1% were diagnosed with COVID-19, 30.1% had someone diagnosed with COVID-9 in their immediate environment, 39.3% were involved in the care of COVID-19 patients, and 26.7% of healthcare workers lived apart from their families due to the risk of transmission during the pandemic. The diet patterns, sleep patterns, and working hours of 56.3%, 63.4%, and 64.8% of them changed, respectively.

The average scores of healthcare workers were compared by gender, and the anxiety levels of males healthcare workers were found to be significantly higher than those of females ( $p = 0.013$ ). The anxiety scores of nurses ( $p = 0.000$ ) and healthcare workers working in the emergency room ( $p = 0.000$ ) were determined to be significantly higher. A significant positive relationship was seen between age ( $p = 0.000$ ), weekly working hours ( $p = 0.000$ ), and anxiety level, and as the age and the weekly working hours increased, anxiety scores increased. No significant relationship was observed between anxiety level, marital status, educational status, chronic illness, and the region of residence ( $p > 0.05$ ) (Table 1).

Anxiety scores of the healthcare workers providing care for COVID-19 patients were found to be significantly higher than the others ( $p = 0.040$ ). Anxiety scores of healthcare workers who left their homes to avoid infecting their families and relatives during the pandemic ( $p = 0.038$ ) and whose working hours changed ( $p = 0.036$ ) were found to be significantly higher. No significant relationship was detected between anxiety level and having someone diagnosed with COVID-19 in the immediate environment, and changes in diet and sleep patterns ( $p > 0.05$ ) (Table 2).

Table 3 shows how anxiety levels of healthcare workers were affected by the COVID-19 pandemic. While 33% of healthcare workers in the study did not have anxiety, 50% had mild, and 17% had severe anxiety. The mean anxiety score of the healthcare workers was  $38.65 \pm 4.68$  (min: 26; max: 56) (Table 3). Emotions that healthcare professionals intensely experienced during the COVID-19 pandemic were loneliness, anger, fear of death, disease transmission, uncertainty, and despair. It was observed that there was a positive and significant relationship between these emotions and anxiety level (Table 4). According to the model created according

to the multiple regression analysis, the factors that significantly affected the anxiety levels of healthcare workers were male gender, weekly working hours, chronic diseases, and feelings of anger and uncertainty. On the other hand, age, fear of death, and hopelessness had no significant effects on the anxiety scores (Table 5).

## Discussion

This study was conducted to explore the anxiety level of healthcare workers during the COVID-19 pandemic. This section includes a discussion of our research findings with the literature.

The descriptive characteristics of the healthcare workers involved in the study showed that most of the participants were females, married, nurses, and had a bachelor's degree. Various studies on the anxiety and depression states of healthcare workers struggling with COVID-19 report that most healthcare professionals were females, single, nurses, and had a bachelor's degree (Labrague & De Los Santos, 2020; Sakaoğlu et al., 2020; Zhu et al., 2020). Therefore, it can be said that the descriptive characteristics of healthcare workers in the relevant studies are similar to each other.

In this study, the female gender was found to be a protective factor for anxiety in the COVID-19 pandemic. However, there are studies in the literature suggesting that gender is not an associated factor for anxiety during the pandemic (Labrague & De Los Santos, 2020) and that females experience more stress, anxiety, and depression during epidemics (Hacımusalar et al., 2020; Lai et al., 2020; Sakaoğlu et al., 2020; Wang et al., 2020; Zhu et al., 2020). It is argued that the rates of depression in females are universally higher depending on factors such as biological markers and gender role changes (Parker & Brotchie, 2010). This current study was carried out when the pandemic first emerged in Turkey when there was a belief that the incidence of COVID-19 was higher in males. Therefore, the anxiety levels of males healthcare workers in our study may have increased.

In this study, the anxiety scores of nurses were found to be significantly higher than the other healthcare professionals. Various studies conducted during the COVID-19 outbreak also revealed that nurses had the highest level of anxiety among healthcare workers (Hacımusalar et al., 2020; Lai et al., 2020). This result may stem from the fact that the working conditions of nurses have been negatively affected during the pandemic, and as nurses are the frontline workers in the patient care and treatment, and they have more physical contact with them.

The anxiety levels of healthcare professionals working in the emergency department were found to be significantly higher than those working in other units in our study. Literature reports that healthcare workers working in

**Table 1** Distribution of mean anxiety scores according to some descriptive characteristics of healthcare workers ( $n = 356$ )

Characteristics	N (%)	State anxiety inventory Mean±SD	p value
<b>Gender</b>			
Female	266 (74.6)	38.29±4.32	<b>p=0.013<sup>a</sup></b>
Male	90 (25.4)	39.71±5.53	
<b>Marital status</b>			
Married	220 (61.8)	38.96±4.94	$p=0.329^a$
Single	136 (38.2)	38.46±4.51	
<b>Education level</b>			
Vocational School of Health	66 (18.5)	39.0±4.47	$p=0.498^b$
Associate Degree	78 (21.9)	38.28±5.59	
Undergraduate Degree	152 (42.7)	38.42±4.09	
Postgraduate Degree	60 (16.9)	39.31±5.01	
<b>Having a chronic disease<sup>1</sup></b>			
Yes	53 (14.9)	38.21±3.99	$p=0.471^a$
No	303 (85.1)	38.72±4.79	
<b>The region healthcare workers live</b>			
Metropolis	215 (60.4)	38.54±4.86	$p=0.808^b$
City Center	117 (32.9)	38.76±4.57	
Rural area	24 (6.7)	39.12±3.63	
<b>Occupation</b>			
Nurse <sup>a</sup>	210 (59.1)	41.70±4.91	<b>p&lt;0.001<sup>b</sup></b> $a>b=c$
Physician <sup>b</sup>	51 (14.5)	38.40±4.58	
Other healthcare staff <sup>c</sup>	115 (26.4)	40.06±4.85	
<b>The units of healthcare workers</b>			
Intensive care <sup>a</sup>	83 (23.3)	41.09±4.20	<b>p&lt;0.001<sup>b</sup></b> $b>a=c$
Emergency service <sup>b</sup>	53 (14.9)	45.58±4.12	
Other clinics <sup>c</sup>	223 (61.8)	37.92±3.66	
Age	32.56±7.30		<b>r=0.333</b>
Weekly working hours	48.09±5.7		<b>p&lt;0.001<sup>c</sup></b> <b>r=0.212</b> <b>p&lt;0.001<sup>c</sup></b>

<sup>a</sup> t-test; <sup>b</sup> one-way ANOVA; <sup>c</sup> Pearson correlation analysis; <sup>1</sup> Chronic disease: Diabetes, Hypertension, Cardiac Diseases, Respiratory System Diseases

Bold emphasis is  $p < 0.005$

emergency departments, a high-risk area for transmission, have higher anxiety levels than those working in other units (Ageron et al., 2020; Wong et al., 2005). This is an expected result as emergency services are regarded as the high-risk health care services where patients are first admitted.

Various studies in the literature show that epidemics cause many different psychological effects in individuals of all age groups (Bao et al., 2020; Okunola et al., 2020; Shigemura et al., 2020). A significant relationship was observed between the age of healthcare workers and their level of anxiety, and the level of anxiety increases with age. These results are thought to be related to the fact that advanced age poses a risk for COVID-19 disease, that the symptoms of the disease are more severe, and the mortality rate is higher in this group.

In our study that the anxiety levels of healthcare workers whose weekly working hours increased also increased.

During epidemics, the change in working conditions of healthcare workers and increase in their workload cause them to experience anxiety (Khangura et al., 2012; Lai et al., 2020; Wong et al., 2005). The increase in working hours of healthcare professionals who work in units of COVID-19 patients is reported to be significantly higher than those who do not. This increase in working hours constitutes a risk factor for anxiety, unhappiness, and burnout in healthcare workers (Hacimusalar et al., 2020). It is thought that the levels of anxiety of healthcare workers increase because the excessive working hours and the increase in the workload make it difficult for healthcare workers to rest, to allocate enough time for themselves and their families, and to reduce contact time with infected patients.

In this study, the anxiety scores of healthcare professionals providing care for patients with COVID-19 were significantly

**Table 2** Distribution of mean anxiety scores according to the healthcare workers’ experience regarding the epidemic process (n = 356)

Characteristics	n(%)	State anxiety inventory Mean±SD	p value
Having someone diagnosed with COVID-19 in the immediate environment			
Yes	110 (30.9)	38.46±5.13	p=0.613 <sup>a</sup>
No	246 (69.1)	38.73±4.48	
Providing care for a patient diagnosed with COVID-19			
Yes	140 (39.3)	39.21±4.90	<b>p=0.040</b> <sup>a</sup>
No	216 (60.7)	38.28±28	
Living with family during the COVID-19 epidemic process			
Living apart from family	95 (26.7)	39.49±4.54	<b>p=0.038</b> <sup>a</sup>
Living with family	261 (73.3)	38.09±5.09	
Eating pattern during COVID-19 process			
Changed	198 (56.3)	38.95±5.04	p=0.165 <sup>a</sup>
Not changed	158 (43.7)	38.25±4.16	
Sleep pattern during COVID-19 process			
Changed	227 (63.4)	38.66±4.55	p=0.968 <sup>a</sup>
Not changed	129 (36.6)	38.64±4.91	
Working hours change during the outbreak			
Yes	228 (64.8)	39.03±4.76	<b>p=0.036</b> <sup>a</sup>
No	128 (35.2)	37.94±4.46	

<sup>a</sup> t- test; <sup>b</sup> Mann Whitney u testi  
 Bold emphasis is  $p < 0.005$

higher than those of other healthcare staff. In a metanalysis, healthcare workers who were in contact with COVID-19 patients had higher stress levels both in the acute and long term (Kisely et al., 2020). Our study results are consistent with the literature. The risk of transmission increases due to the close contact of healthcare professionals involved in the care of patients with COVID-19. It is possible to explain this situation by the fact that there is a positive relationship between the risk of transmission and anxiety level.

It is known that healthcare professionals experience anxiety during the pandemic due to the risk of becoming infected and infecting their families and others (Kisely et al., 2020; Wong et al., 2005). This study revealed that the anxiety levels of healthcare workers who had to live separately from their families not to infect their families and relatives were higher than the healthcare professionals living with their families. In this challenging period, it is believed that their anxiety levels are higher due to the decrease in emotional support from the family and isolation because of the separation from family members, etc.

**Table 3** Distribution of health workers’ state anxiety scale mean scores (n = 356)

Inventory	n (%)	Mean±SD	Median (min.-max)
State anxiety inventory		38.65±4.68	38.00(26–56)
Normal	116 (33.0)	33.93±1.88	34.00(26–36)
Mild	176 (50.0)	39.11±1.73	39.00(37–42)
High	64 (17.0)	46.43±2.95	46.00(43–56)

SD, Standard Deviation

The prevalence of anxiety in healthcare workers during the COVID-19 outbreak is higher than the rest of the population (Chen et al., 2020; Dai et al., 2019; Du et al., 2020; Hacimusalar et al., 2020; Lai et al., 2020). Most of the healthcare workers had anxiety in our study. It is not surprising that the anxiety levels of healthcare professionals increase during the pandemic, but the rapid spread of the COVID-19 pandemic, not knowing when it will end and what the consequences will be are associated factors that increase anxiety.

During the pandemics, healthcare workers feel insufficient support, anger, fear, disappointment, guilt, helplessness, insecurity, and anxiety more, and experience more trauma symptoms in the long term and are frequently stigmatized by society (El-Hage

**Table 4** Relationship between the healthcare workers’ feelings and their anxiety scores during epidemic process (n = 356)

Feelings	Anxiety level	
	r*	p**
Loneliness	0.111	0.037
Boredom	0.036	0.503
Anger	0.516	<0.001
Fear of death	0.180	0.001
Fear of disease transmission	0.152	0.004
Uncertainty	0.246	<0.001
Hopelessness	0.216	<0.001

r\* : correlation coefficient (Cohen 1992) \*\* Pearson correlation coefficient analysis

**Table 5** Multiple regression analysis results between the State Anxiety Inventory and independent variables

Dependent variable: state anxiety inventory					
Independent variables	B	SE	$\beta$	t	p
Constant	141.38	23.65		6.94	<0.001
Gender (0.Female, 1. Male)	4.14	0.66	0.20	6.22	<0.001
Age (numerical/year)	-0.13	0.11	-0.42	-1.24	0.21
Weekly working hours (numerical/h)	1.99	0.52	0.12	3.77	<0.001
Presence of chronic diseases (0.No 1.Yes)	3.55	1.13	0.10	3.13	<0.001
Anger (0.Yok, 1.Var)	0.972	0.100	0.29	9.74	<0.001
Uncertainty (0.No, 1.Yes)	1.92	0.66	0.08	2.91	<0.001
Fear of death (0.No, 1.Yes)	0.74	1.49	0.03	0.50	0.61
Hopelessness (0.No, 1.Yes)	-1.36	1.27	-0.05	-1.07	0.28

Model R = 0.39; R<sup>2</sup> = 0.15; Adjusted R<sup>2</sup> = 0.14; F = 4.82; p < 0.01

et al., 2020; Lai et al., 2020; Reynolds et al., 2008; Wong et al., 2005). Our study also revealed a significant relationship between the emotions and anxiety levels in healthcare workers, and they experienced loneliness, anger, fear of death, fear of infection, uncertainty, and hopelessness during the pandemic. Healthcare workers are the most vulnerable group at the center of the risk of infection. They are exposed to various negative factors and physical, mental, and environmental stimuli against this pandemic, which are thought to cause negative psychological effects on healthcare workers.

## Conclusion and Recommendations

Our study showed that 50% of health workers have a mild level of anxiety, and 17% have a severe level of anxiety in Turkey due to the pandemic. Male gender, advanced age, being a nurse, working in the emergency department, changed working hours, and increased weekly working hours are associated with the anxiety levels of healthcare workers. The most intense emotions the health workers experience during COVID-19 in Turkey have been loneliness, anger, fear of death, fear of disease transmission uncertainty, and despair. It has been observed that these emotions have increased their anxiety levels. We think that determining the anxiety levels of healthcare workers and the associated factors during the COVID-19 pandemic in our study will guide the planning of psychological interventions for healthcare workers.

## Strengths and Limitations

This research presents several overarching strengths. In the literature, the number of studies examining the anxiety levels and emotions of healthcare workers during the COVID-19 outbreak is limited. No study to our knowledge had been carried out to explore the level of anxiety in healthcare workers in Turkey when our study was conducted.

Moreover, our study may reflect the general nature of healthcare workers' anxiety in Turkey because it is a multi-center study involving seven regions. However, the study also had several limitations. It was aimed to include all healthcare professionals across the country in the study, but there was limited participation. Besides, only the short-term effects of anxiety on health workers could be determined since the study was conducted in the period in which the pandemic first appeared in Turkey. The long-term effects of anxiety on healthcare workers are not yet known. Therefore, the long-term experiences of the research subjects would be a valuable avenue to explore in the future.

**Acknowledgments** We thank all the health workers who participated in this study.

**Authors' Contribution** The authors share the responsibility for the manuscript.

Conception and design: CUS; data collection: CUS, NK; analysis and interpretation: NK, and manuscript writing: CUS, NK.

**Data Availability** The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

## Declarations

**Conflict of Interest** The authors declare that there are no potential conflicts of interest regarding this article.

**Disclaimer** The content is solely the responsibility of the authors.

## References

- Ageron, F. X., Sarasin, F., Pasquier, M., & Carron, P. N. (2020). Urgences hospitalières : Crise COVID-19 et aspects organisationnels [Emergency department : COVID-19 crisis and organizational aspects]. *Revue médicale suisse*, 16(692), 924–929.

- Bai, Y., Lin, C. C., Lin, C. Y., Chen, J. Y., Chue, C. M., & Chou, P. (2004). Survey of stress reactions among health care workers involved with the SARS outbreak. *Psychiatric Services*, *55*(9), 1055–1057. <https://doi.org/10.1176/appi.ps.55.9.1055>.
- Bao, Y., Sun, Y., Meng, S., Shi, J., & Lu, L. (2020). 2019-nCoV epidemic: Address mental health care to empower society. *Lancet (London, England)*, *395*(10224), e37–e38. [https://doi.org/10.1016/S0140-6736\(20\)30309-3](https://doi.org/10.1016/S0140-6736(20)30309-3).
- Chen, Q., Liang, M., Li, Y., Guo, J., Fei, D., Wang, L., He, L., Sheng, C., Cai, Y., Li, X., Wang, J., & Zhang, Z. (2020). Mental health care for medical staff in China during the COVID-19 outbreak. *The lancet. Psychiatry*, *7*(4), e15–e16. [https://doi.org/10.1016/S2215-0366\(20\)30078-X](https://doi.org/10.1016/S2215-0366(20)30078-X).
- Dai Y., Hu G., Xiong H., Qiu H., Yuan X. Dai Y., Hu G., Xiong H., Qiu H., Yuan X. (2019) Psychological impact of the coronavirus disease 2019 (COVID-19) outbreak on healthcare workers in China. *medRxiv*. <https://doi.org/10.1101/2020.03.03.20030874>
- Du, J., Dong, L., & Wang, T. (2020). Psychological symptoms among frontline healthcare workers during COVID-19 outbreak in Wuhan. *General Hospital Psychiatry*, *67*, 144–145. <https://doi.org/10.1016/j.genhosppsych.2020.03.011>.
- El-Hage, W., Hingray, C., Lemogne, C., Yrondi, A., Brunault, P., Bienvu, T., Etain, B., Paquet, C., Gohier, B., Bennabi, D., Birmes, P., Sauvaget, A., Fakra, E., Prieto, N., Bulteau, S., Vidailhet, P., Camus, V., Leboyer, M., Krebs, M. O., & Auquier, B. (2020). Les professionnels de santé face à la pandémie de la maladie à coronavirus (COVID-19) : quels risques pour leur santé mentale ? [Health professionals facing the coronavirus disease 2019 (COVID-19) pandemic: What are the mental health risks?]. *L'Encephale*, *46*(3S), S73–S80. <https://doi.org/10.1016/j.encep.2020.04.008>.
- Greenberg, N., Docherty, M., Gnanapragasam, S., & Wessely, S. (2020). Managing mental health challenges faced by healthcare workers during COVID-19 pandemic. *BMJ*, *368*.
- Hacimusalar, Y., Yaşar, A. B., Civan Kahve, A., & Aydın, M. S. (2020 Oct). Anxiety and hopelessness levels in COVID-19 pandemic: A comparative study of healthcare professionals and other community sample in Turkey. *Journal of Psychiatric Research*, *129*, 181–188.
- Hanscom, D., Clawson DR., Porges SW, Bunnage R, Aria L, Lederman S, Taylor J, Carter CS. (2020). Polyvagal and global cytokine theory of safety and threat Covid-19 – Plan B. *SciMedicine Journal*, *2*(0), 9–27. <https://doi.org/10.28991/SciMedJ-2020-02-SI-2>
- Kackin, O., Ciydem, E., Aci, O. S., & Kutlu, F. Y. (2020). Experiences and psychosocial problems of nurses caring for patients diagnosed with COVID-19 in Turkey: A qualitative study. *The International Journal of Social Psychiatry*, *20764020942788*. Advance online publication. <https://doi.org/10.1177/0020764020942788>.
- Khangura, S., Konnyu, K., Cushman, R. et al. (2012) Evidence summaries: the evolution of a rapid review approach. *Syst Rev* *1*, 10. <https://doi.org/10.1186/2046-4053-1-10>
- Kisely, S., Warren, N., McMahon, L., Dalais, C., Henry, I., & Siskind, D. (2020). Occurrence, prevention, and management of the psychological effects of emerging virus outbreaks on healthcare workers: Rapid review and meta-analysis. *BMJ*, *369*, m1642. <https://doi.org/10.1136/bmj.m1642>.
- Labrague LJ, De Los Santos JAA (2020 Oct) COVID-19 anxiety among front-line nurses: Predictive role of organisational support, personal resilience and social support. *J Nurs Manag*, *28*(7):1653–1661. <https://doi.org/10.1111/jonm.13121>. Epub 2020 Aug 21. PMID: 32770780; *PMCID*: PMC7436313.
- Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., Wu, J., Du, H., Chen, T., Li, R., Tan, H., Kang, L., Yao, L., Huang, M., Wang, H., Wang, G., Liu, Z., & Hu, S. (2020). Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Network Open*, *3*(3), e203976. <https://doi.org/10.1001/jamanetworkopen.2020.3976>.
- Lamptey E & Serwaa D. (2020). The use of zipline drones technology for COVID-19 samples transportation in Ghana *HighTech and Innovation Journal*. *1*(2). <https://doi.org/10.28991/HIJ-2020-01-02-03>
- Lee, S. M., Kang, W. S., Cho, A. R., Kim, T., & Park, J. K. (2018). Psychological impact of the 2015 MERS outbreak on hospital workers and quarantined hemodialysis patients. *Comprehensive Psychiatry*, *87*, 123–127. <https://doi.org/10.1016/j.comppsy.2018.10.003>.
- Maunder, R., Hunter, J., Vincent, L., Bennett, J., Peladeau, N., Leszcz, M., Sadavoy, J., Verhaeghe, L. M., Steinberg, R., & Mazzulli, T. (2003). The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. *CMAJ : Canadian Medical Association Journal = Journal de l'Association Medicale Canadienne*, *168*(10), 1245–1251.
- Okunlola MA, Lamptey E, Senkyire EK, Dorcas S, Benita Aki Dooshima BA (2020). Perceived myths and misconceptions about the novel COVID-19 outbreak. *SciMedicine Journal*, *2*(3):108–117. <https://doi.org/10.28991/SciMedJ-2020-0203-1>
- Öner, N., & Le, C. A. (1983). *State-Trait Anxiety Inventory Handbook*. Istanbul: Bogazici University Press.
- Parker, G., & Brotchie, H. (2010). Gender differences in depression. *International review of psychiatry (Abingdon, England)*, *22*(5), 429–436. <https://doi.org/10.3109/09540261.2010.492391>.
- Republic of Turkey Ministry of Health. (2020, December). COVID19: New coronavirus disease. <https://covid19bilgi.saglik.gov.tr/tr/>
- Reynolds, D. L., Garay, J. R., Deamond, S. L., Moran, M. K., Gold, W., & Styra, R. (2008). Understanding, compliance and psychological impact of the SARS quarantine experience. *Epidemiology and Infection*, *136*(7), 997–1007. <https://doi.org/10.1017/S0950268807009156>.
- Sakaoğlu HH, Orbatu D, Emiroğlu M, Çakır Ö (2020) Covid-19 salgını sırasında sağlık çalışanlarında spielberger durumluk ve sürekli kaygı düzeyi: Tepecik hastanesi örneği. *Tepecik Eğit. ve Araşt. Hast. Dergisi*, *30*(Ek sayı):1–9. <https://doi.org/10.5222/terh.2020.56873>
- Shigemura, J., Ursano, R. J., Morganstein, J. C., Kurosawa, M., & Benedek, D. M. (2020). Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: Mental health consequences and target populations. *Psychiatry and Clinical Neurosciences*, *74*(4), 281–282. <https://doi.org/10.1111/pcn.12988>.
- Spielberger, C. D., Gorsuch, R. L., & Lushene, R. E. (1970). *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologist Press.
- Sun, N., Wei, L., Shi, S., Jiao, D., Song, R., Ma, L., Wang, H., Wang, C., Wang, Z., You, Y., Liu, S., & Wang, H. (2020). A qualitative study on the psychological experience of caregivers of COVID-19 patients. *American Journal of Infection Control*, *48*(6), 592–598. <https://doi.org/10.1016/j.ajic.2020.03.018>.
- Tuncay, F. E., Koyuncu, E., & Özel, Ş. (2020). A review of protective and risk factors affecting psychosocial health of healthcare workers in pandemics. *Ankara Medical Journal*, *2*, 488–501. <https://doi.org/10.5505/amj.2020.02418>.
- Uzun, C. S., Aydın, M., & Kulakac, N. (2020). Anxiety, motivation, stress levels and associated factors Among University students in the COVID-19 pandemic. *Cyprus J Med Sci*. <https://doi.org/10.5152/cjms.2020.2685>.
- Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health*, *17*(5), 1729. <https://doi.org/10.3390/ijerph17051729>.

- Wong, T.W., Yau, J.K., Chan, C.L., Kwong S.Y.R., Ho, M.Y.S., Lau, C.C., Lau, L.F., & Lit, H.C. (2005). The psychological impact of severe acute respiratory syndrome outbreak on healthcare workers in emergency departments and how they cope. *Eur J Emerg Med*, 12(1), 13–18. <https://doi.org/10.1097/00063110-200502000-00005>.
- Xiang, Y. T., Yang, Y., Li, W., Zhang, L., Zhang, Q., Cheung, T., & Ng, C. H. (2020). Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *The Lancet. Psychiatry*, 7(3), 228–229. [https://doi.org/10.1016/S2215-0366\(20\)30046-8](https://doi.org/10.1016/S2215-0366(20)30046-8).
- Zhu, J., Sun, L., Zhang, L., Wang, H., Fan, A., Yang, B., Li, W., & Xiao, S. (2020 Apr 29). Prevalence and influencing factors of anxiety and depression symptoms in the first-line medical staff fighting against COVID-19 in Gansu. *Frontiers in Psychiatry*, 11, 386. <https://doi.org/10.3389/fpsyt.2020.00386>.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.