

Field study for determining the effect of COVID-19 on healthcare workers

Effect of COVID-19 on healthcare workers

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Abstract

Aim: This study determines the anxiety levels of health workers by evaluating their anxiety status in the challenging process of the pandemic.

Material and Methods: One hundred forty health workers who studied at pandemic hospital were included in the study. The data were collected using the Pandemic Period Data Form (PPDF), and the State-Trait Anxiety Inventory (STAI), prepared for assessing anxiety levels of health workers in the face of the COVID-19 outbreak.

Results: In the study there was a significant difference between the health care workers working in intensive care units and those working in non-intensive care units in terms of age, gender, and presence of children.

We found that there was a significant difference in STAI state anxiety scores ($p < .05$) of health workers in terms of having children, and they had higher levels of state anxiety. On average, the health workers from intensive care units had higher levels of PPDF anxiety.

In this study, we detected that the COVID-19 anxiety levels of the health workers between the ages of 20 and 30 were higher compared with those aged 41 and above ($p < .05$).

Discussion: It was found that the pandemic process had a negative impact on health workers as their anxiety increased in this process. Elimination of the gaps related to application or information in the published guidelines can help health workers feel more safe.

Keywords

COVID-19; Health workers; Anxiety state; Anxiety

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Introduction

The present novel Coronavirus (CoV) disease, also called a severe acute respiratory syndrome (SARS)-CoV-2 and coronavirus disease 2019 (COVID-19), is an emerging global health threat [1]. The COVID-19 epidemic started from Wuhan city of China at the end of December 2019 and since then spread rapidly to other countries [2]. On March 11, 2020, the World Health Organization (WHO) announced that COVID-19 is 'a public health emergency of international concern' [3].

Existing evidence suggests that COVID-19 is transmitted by close contact and droplets. Therefore, health workers who care for COVID-19 patients are considered to have a high risk of infection, and the protection of healthcare workers is among the top priorities [4].

As with many previous infectious disease outbreaks such as severe acute respiratory syndrome (SARS) and Ebola, healthcare workers are at the forefront of the risk of infection and death [5]. In the first study conducted on health workers in Wuhan after the COVID-19 outbreak first appeared, it was found that 71.3% of health teams suffered from mental disorders at a sub-threshold and light level, 22.4% at a moderate level, and 6.2% at a severe level. It was emphasized that access to mental health services was important for health personnel working during the outbreak to improve their physical health perceptions and to alleviate acute mental distress [6].

This study evaluates the level of anxiety of health personnel working in the hospital environment where COVID-19 is being diagnosed and treated.

Material and Methods

The study included 140 health professionals working at the emergency services, inpatient services and intensive care units of Niğde Ömer Halisdemir University (NOHU) Training and Research Hospital. The data were collected using the Information Form, designed for identifying characteristics of individuals, the Pandemic Period Data Form (PPDF), a questionnaire prepared to assess the anxiety of health workers in the face of the COVID-19 outbreak, and the State-Trait Anxiety Inventory (STAI) to measure state anxiety. The data were analyzed using the IBM SPSS Statistics (version 23). Before proceeding with the study, approval from the hospital where the study would be conducted was obtained. In addition, approvals from the Ministry of Health of Turkey (Application Approval Code: 2020-05-11T22_09_29) and the Ethics Committee of Niğde Ömer Halisdemir University (No. 86837521-050.99-E.23016) were received.

Information Form related to Characteristics of Individuals: It consists of questions about age, gender, marital status, title, frequency of visiting the family, working unit, and frequency of contact with COVID-19-positive patients.

Pandemic Period Data Form (PPDF) (Questionnaire to assess the anxiety state of health workers against the COVID-19 outbreak): The questions addressed to the health professionals working at the NOHU Training and Research Hospital were related to adequacy of the equipment and devices in the service, working hours at the hospital, sleep, shelter and nutrition arrangements, the belief that the process will end, perceiving each patient as positive for COVID-19, and the fear of the employees of infecting themselves, their patient, family, and loved ones and

were scored as Never (1), Rarely (2), Sometimes (3), Usually (4), and Always (5).

State-Trait Anxiety Inventory (Spielberger CD. 1970, Oner N.1985): Directive: A number of expressions used by people to describe their own feelings are given. The participant reads each expression and marks the appropriate option from one of the parentheses on the right side of the expressions that defines how he/she feels at the moment. The participant marks the answers quickly without losing too much time. In this way, the state of anxiety is measured.

Data Analysis

In this study, independent group t-test, variance analysis, and correlation analysis techniques were used for data analysis. Before the data were analyzed, the assumptions of the analyses were examined. Analysis of the data was carried out with the SPSS (version 23) software package. The margin of error was considered .05.

Results

Face-to-face interviews were conducted with 140 health professionals who were on duty for COVID-19 at the NOHU Training and Research Hospital.

In terms of the gender distribution of the health workers, 87 were women (62.1%) and 53 were men (37.9%). There was no difference between the PPDF scores of the health workers in terms of gender ($t(138) = .11, p > .05$). In other words, the PPDF levels of male and female health workers were similar. In terms of gender, there was a difference in the state anxiety levels of the health workers ($t(138) = -4.08, p < .05$). On average, male health workers had higher state anxiety levels.

The number of health workers was 83 (59.3%) in non-intensive care units and 57 (40.7%) in intensive care units. It was determined that there was a difference in the PPDF scores of the health workers in terms of the unit in which they worked ($t(138) = -2.23, p < .05$). On average, the health workers in intensive care units had higher levels of PPDF anxiety.

There was no difference in the STAI state anxiety levels of the health workers in terms of the unit in which they worked ($t(138) = -.29, p > .05$). In other words, the state anxiety levels of those who worked in intensive care units and other units were similar (Table 1).

Table 1. Inventory results according to units that they worked

	Unit	N	M	SD	t	p
PPDF	Normal	83	61.24	18.57	-2.23	.03*
	Intensive care	57	68.15	17.26		
STAI	Normal	83	40.04	5.96	-.29	.75
	Intensive care	57	40.35	6.30		

*p < .05

Table 2. Inventory results of health workers in terms of having children

	Have children	N	M	SD	t	p
PPDF	Yes	96	62.32	18.15	-1.67	.10
	No	44	67.84	18.27		
STAI	Yes	96	41.00	6.33	2.42	.75
	No	44	38.36	5.10		

*p < .05

Table 3. COVID-19 anxiety levels of the health workers according to age groups

Scale	Faculty	n	M	Source of Variance	Sum of Squares	SD	Mean of Squares	F	Difference
PPDF	1. 20-30	46	68.05	Between Groups	2221.09	2	1110.55	3.43*	1-3
	2.31-40	59	64.78	In Groups	44392.44	137	324.03		
	3. 41 and above	35	57.60	Total	46613.54	139			

*p < .05

The number of health workers having children was 96 (68.6%), and the number of those who had no children was 44 (31.4%). There was no difference in the PPDF scores of the health workers in terms of having children ($t(138) = -1.67, p > .05$). In other words, the COVID-19 anxiety levels of health workers with and without children were similar.

It was determined that there was a difference in the STAI state anxiety levels of the health workers in terms of having children ($t(138) = 2.42, p < .05$). On average, those who had children had higher levels of state anxiety (Table 2).

In terms of the age variable, the health workers were found to have differences in PPDF scores ($F(2, 137) = 3.43, p < .05$). As a result of the Scheffe test conducted to determine the source of this difference, it was found that the COVID-19 anxiety levels of the health workers between the ages of 20 and 30 were higher than those of the health workers aged 41 and above (Table 3). In terms of the variable of age, there was a difference in STAI state anxiety levels of the health workers ($F(2, 137) = 3.36, p < .05$). As a result of the Scheffe test conducted to determine the source of this difference, the state anxiety levels of the individuals aged 41 and above were found to be higher than those of the individuals in the 20-30 age groups.

Discussion

In determining the impact of COVID-19 on health workers, this study found that there was a significant difference between the health workers in terms of age, gender, presence of children, working in intensive care and non-intensive care services, and there was no significant difference in marital status and title. In this study, it was observed that the state anxiety levels in the pandemic process differed based on gender, and the state anxiety levels of male health workers were higher.

Concerns about the transmission of the virus, the safety of their fellow health workers and peers may lead to resentment, anxiety, insomnia, and stress. The need for frequent contact with patients in isolation units has exhausted health workers physically and psychologically and caused high stress levels and insomnia. Healthcare workers were more likely to have poor sleep quality [7]. During the COVID-19 outbreak, more than a third of health workers suffered from insomnia. The literature supports the results of this study. Stress, anxiety, and fear caused by the pandemic process by 55.1% caused disturbance of sleep.

Hospitals have turned into very stressful environments during the outbreak. The troubles related to materials, equipment supply, creation of clean spaces, and the obligation of the staff to work in two-layer protection and masks at high temperatures and negative pressures uninterrupted have amplified stress [8]. The findings of this study are in line with the literature, and 62.8% of the participants stated that it is difficult to work

continuously with protective equipment and this challenge is a source of stress.

In particular, health workers working in certain units of hospitals are at greater risk of infection. Those working in emergency services, intensive care, and infectious disease services, as well as family physicians in primary care, are exposed to relatively high risks [9]. In this study, health workers who work in intensive care units had higher COVID-19 anxiety levels on average compared with those working in non-intensive care units. This is due to the fact that patient treatment is more intensive, the contact with the patient is closer in these units, and patients in intensive care units have higher virus loads.

In terms of state anxiety levels, there was no difference in the mean scores of health workers in intensive care and non-intensive care units, and health workers in the hospital generally had similar anxiety levels. The lack of difference in state anxiety levels can be explained by the fact that health workers had common levels of anxiety in their family and social lives, regardless of the unit in which they work.

In some studies, the mean state and trait anxiety scores of health workers aged 35 years and above were found to be slightly higher, and this was not statistically significant. There are studies that show that the state of anxiety increases with age, as well as studies reporting no difference [10]. In the study, it was observed that anxiety and depression levels in young and less experienced health workers increased [11]. In this study, COVID-19 anxiety levels of the health workers aged 20 to 30 were higher than those of the health workers aged 41 and above. The state anxiety levels of the individuals aged 41 and above were higher than those in the 20-30 age group. As the rates of marriage and having children increase with age, older health workers may experience additional concerns for their spouse and children, and this may lead to anxiety scores that are numerally higher but statistically not significant. Familiarity with and adaptation to the working environment, higher levels of knowledge and ability to use personal protective equipment, and professional experience in the follow-up and treatment of clinically severe patients may be reasons for lower levels of COVID-19 anxiety in the health workers aged 41 and above. Higher levels of state anxiety in older age groups may be caused by additional anxiety for family members.

Health care workers need to protect their health and provide adequate working conditions, e.g., supply of necessary and adequate medical protective equipment, the regulation of adequate rest and recovery programs for strengthening flexibility and psychological well-being [12]. The safety of health workers is a priority concern. Seeing the friends they work with intubated, the loss of patients they provide care for, the fear of infecting their families and loved ones can damage their sense of security. These problems were reported by health workers

during the fight against the SARS [13,14]. The fear of being infected is higher in health workers than in the community. This fear stems from the fact that health professionals fear infecting their family members or close friends, rather than becoming infected themselves. It was found in various studies that health workers from China and Canada fighting SARS had high levels of fear and anxiety about infecting family members [15,16]. In this study, health professionals experienced an anxiety level of 51.5% for getting infected with the virus, but their anxiety level for infecting the family members and close friends was 72.1%. For these reasons, health workers prefer to stay away from their homes and family members for a long period of time, without physical contact with their spouses and children and contacting them generally by telephone. This, in turn, leads to a significant decrease in emotional and social support from the family. This was often experienced in previous outbreaks and in the current fight against COVID-19 [17]. When face-to-face communication is not safe, hearing their voices on the phone and trying to understand how they feel and how they look after each other may be helpful. Staying in touch with their loved ones will give healthcare workers strength when they try to cope with their fears. It is believed that these recommendations may have positive effects on reducing the level of anxiety of health workers.

Health workers from different countries who had experience working in outbreaks were asked about the factors they believed to be effective in working with sufficient motivation in future epidemics. Health workers listed ensuring personal safety, having adequate disease knowledge, and providing compensation support as priority motivation factors [13,18,19]. In this study, anxiety levels of health workers also increased because they perceived each patient as COVID-19-positive (50.7%) and also because of the lack of sufficient community sensitivity to the disease (71.5%). Questions related to nutrition during the pandemic, accommodation, reporting possible problems to upper units, increases or decreases in the number of health workers, and working at different units during this process revealed no anxiety associated with them. No accommodation problem emerged for the hospital where the study was conducted, since the hospital administration created alternative accommodation facilities in the early days of the outbreak. It was observed that certain problems that came to the agenda during normal working periods were postponed because of the pandemic period.

Conclusion

This study demonstrates that the pandemic process had a negative impact on health workers, as their anxiety states increased during this process. It was observed that health workers experienced intense anxiety, particularly due to increased risk of infection compared with other individuals in the community, and the risk of infecting their family members, their loved ones, their patients, and other people. This, in turn, increased their anxiety levels and caused them to work under intense psychological pressure, in addition to the challenges of their increased workload and prolonged working with personal protective equipment.

In accordance with these results, eliminating the gaps in the practices or information in published guidelines about the

process can contribute positively to health workers feeling safer. Regulation of working hours in accordance with the conditions of pandemic period, follow-up and evaluation of employee efficiency and sleep patterns by the responsible units, and provision of professional support when necessary, can contribute to the reduction of the burden of the physical working conditions of health workers and the psychological problems they experience.

The proportion of COVID-19 patients detected in the region of our health facility to the total population is less than 1%. Compared with metropolitan cities and other countries, it can be said that this proportion is lower. However, despite this, it was seen that the problems and concerns experienced by our health workers were similar to those reported in the literature. The presence of unexplained points on disease and transmission routes, as well as uncertainties and inadequacies in treatment, have created similar restrictions and problems in work, family, and social life for health workers on a global scale, regardless of the ratio of positive patients.

Future studies with more participants may deal with anxiety experienced by health professionals and ways of coping with them in the pandemic process.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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References

1. Fisher D, Heymann D. Q&A: the novel coronavirus outbreak causing COVID-19. *BMC Med.* 2020;18(1):57.
2. Wu F, Zhao S, Yu B, Chen YM, Wang W, Song ZG, et al. A new coronavirus associated with human respiratory disease in China. *Nature.* 2020;579(7798):265–9.
3. Li X, Wang W, Zhao X, Zai J, Zhao Q, Li Y, et al. Transmission dynamics and evolutionary history of 2019-nCoV. *J Med Virol.* 2020;92(5):501–11.
4. Li Z, Ge J, Yang M, Feng J, Qiao M, Jiang R, et al. Vicarious traumatization in the general public, members, and non-members of medical teams aiding in COVID-19 control. *Brain Behav Immun.* 2020;88:916–19.
5. Sim MR. The COVID-19 pandemic: major risks to healthcare and other workers on the front line. *Occup Environ Med.* 2020;77(5):281–82.
6. Kang L, Ma S, Chen M, Yang J, Wang Y, Li R, et al. Impact on mental health and perceptions of psychological care among medical and nursing staff in Wuhan during the 2019 novel coronavirus disease outbreak: A cross-sectional study. *Brain Behav Immun.* 2020;87:11–17.
7. Huang Y, Zhao N. Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. *Psychiatry Res.* 2020;288:112954.
8. Zhang C, Yang L, Liu S, Ma S, Wang Y, Cai Z, et al. Survey of insomnia and related social psychological factors among medical staffs involved with the 2019 novel coronavirus disease outbreak. *Front Psychiatry.* 2020;11:306.
9. Tuncay FE, Koyuncu E, Özel Ş. A Review of Protective and Risk Factors Affecting Psychosocial Health of Healthcare Workers in Pandemics. *Ankara Med J.* 2020;20:488–501.
10. Pond EF, Kemp VH. A comparison between adolescent and adult women on prenatal anxiety and self-confidence. *J Matern Child Nurse J.* 1992;20(1):11–20.
11. Shajan A, Nisha C. Anxiety and depression among nurses working in a tertiary care hospital in South India. *Int J Adv Med.* 2019;6:1611–15.
12. Zhang WR, Wang K, Yin L, Zhao WF, Xue Q, Peng M, et al. Mental health and psychosocial problems of medical health workers during the COVID-19 epidemic

in China. *Psychother Psychosom.* 2020;89(4):242–50.

13. Lee SH, Juang YY, Su YJ, Lee HL, Lin YH, Chao CC. Facing SARS: Psychological impacts on SARS team nurses and psychiatric services in a Taiwan general hospital. *Gen Hosp Psychiatry.* 2005;27(5):352–8.

14. Wu P, Fang Y, Guan Z, Fan B, Kong J, Yao Z, et al. The psychological impact of the SARS epidemic on hospital employees in China: exposure, risk perception, and altruistic acceptance of risk. *Can J Psychiatr.* 2009;54(5):302–11.

15. 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. *Psychiat Serv.* 2004;55(9):1055–7.

16. Robertson E, Hershenfield K, Grace SL, Stewart DE. The psychosocial effects of being quarantined following exposure to SARS: A qualitative study of Toronto health care workers. *Can J Psychiatr.* 2004;49(6):403–7.

17. Xiao H, Zhang Y, Kong D, Li S, Yang N. The effects of social support on sleep quality of medical staff treating patients with coronavirus disease 2019 (COVID-19) in January and February 2020 in China. *Med Sci Monit.* 2020;26:e923549.

18. Khalid I, Khalid TJ, Qabajah MR, Barnard AG, Qushmaq IA. Healthcare workers emotions, perceived stressors and coping strategies during a MERS-CoV outbreak. *Clin Med Res.* 2016;14(1):7–14.

19. Simonds AK, Sokol DK. Lives on the line? Ethics and practicalities of duty of care in pandemics and disasters. *Eur Respir J.* 2009;34(2):303–9.

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