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INTRODUCTION

COVID-19 disease caused by the SARS-CoV2 virus; it was detected in Wuhan, China, in December 2019 and became a pandemic in a short time. According to the Center for Disease Control and Prevention of the People's Republic of China, 3.8% of the total cases were healthcare workers, and 14.8% were defined as severe cases (1). As of 15 March 2020, 2026 healthcare workers were diagnosed with COVID-19 in Italy (2). These data show that there is a severe risk of transmission among healthcare workers. This risk increases even more in intensive care workers with aerosol-forming interventions. The increased risk of disease

State-trait anxiety, death anxiety, depression levels of intensive care workers during the COVID-19 pandemic and related factors

Abstract

Aim: During the COVID-19 pandemic, intensive care workers' workload and stress response with high transmission risk increased. As a result of poor coping skills with increasing stress, psychiatric problems such as anxiety and depression may occur. In our study, we aimed to evaluate the anxiety, depression, and death anxiety parameters and related demographic data of intensive care workers struggling in the COVID-19 pandemic.

Materials and methods: The data were collected by applying scales including socio-demographic information, state-trait anxiety scale (STAI), Beck depression scale, and death anxiety scale to intensive care workers of the pandemic hospital in Erzurum province with an online questionnaire.

Results: A total of 70 participants answered the scale questions with the online questionnaire. Participants' state and trait anxiety scores were above 42, and the frequency of intensive care workers with high anxiety levels was 78.5% and 45.7%, respectively. 54.2% of the participants had moderate and above death anxiety, and 57.1% had a Beck depression inventory score above 10. State-trait anxiety and death anxiety were significantly higher in females than males.

Conclusions: In conclusion, the findings of our study revealed that intensive care workers working in the diagnosis, treatment, and care of severe-fatal diseases showed symptoms of anxiety and depression during the COVID-19 pandemic period, being young and female were risk factors for state-trait anxiety, death anxiety, and depression.

Keywords: COVID-19, intensive care workers, anxiety, depression

transmission and the possibility of transmitting this disease to their relatives may cause stress for intensive care workers. The inability to cope with this stress can cause anxiety and depression and affect people's daily life, work-life and social relationships.

Similar psychological effects have been experienced during other pandemics. Studies conducted during the Severe Acute Respiratory Tract (SARS) pandemic in 2002 revealed that fear, anxiety, and other emotions had severe health consequences that could not be ignored; it has been found to cause an increase in the frequency of anxiety and depression (3-5). Behavioral analyses on the internet network reflect public anxiety and behavior

changes after sudden health events. Studies conducted during the Ebola hemorrhagic fever pandemic showed that the pandemic had negative effects on mental health; observed that people's fear of the virus causes anxiety and depression (6-8). In 2009, at the start of the Influenza pandemic, Turkey's outbreak-related blogs on their local websites, the presence of health and deaths words were significantly higher, and positive emotion words were significantly lower than in the control group (9-11).

The rapid increase in the number of suspected cases and patients during the COVID-19 pandemic created panic and mental stress in societies. Limited information about the disease, misinformation, and the unpredictable course of the disease worldwide increased anxiety. Healthcare professionals who meet the diagnosis, treatment, and care needs of patients were at the forefront of this war. The increased need for medical assistance due to the impact on society, the tiring work environment, the concern that protective equipment would be inadequate, and the risk of getting sick and infecting their relatives and teammates created an additional psychological burden. Health workers in the People's Republic of China have been caught physically and mentally unprepared as it is the source of the pandemic. Due to the sudden emergence and uncertain nature of the pandemic, at the onset of the pandemic, an increase in insomnia, anxiety, depression, somatization, and obsessive-compulsive symptoms was observed among healthcare workers compared to non-healthcare professionals (12).

In our study, we aimed to evaluate the anxiety, depression, and death anxiety parameters of intensive care workers struggling with the COVID-19 pandemic and to evaluate their relationship with age, gender, and education level.

MATERIAL AND METHODS

Study Groups and Questionnaire

In this study, health personnel working in Erzurum Regional Training and Research Hospital Intensive Care units were taken as the sample. An online survey form was sent to the participants between 1 May and 31 May 2020. Written consent from the participants was obtained at the beginning of the questionnaire form. They were asked to answer questions about socio-demographic information, educational status, the number of people they live at home, working time in the relevant unit, state-trait anxiety inventory (STAI), Beck depression inventory, and death anxiety scale. All of the 70 participants in the study answered all of the online questionnaires.

State-Trait Anxiety Inventory (STAI)

STAI is a self-assessment questionnaire of short statements. It includes two separate scales consisting of forty items in total. The State Anxiety scale describes how the individual feels at a particular moment and under certain conditions; it requires the applicant to answer by considering his/her feelings about the situation he/she is within. On the other hand, the Trait Anxiety Scale requires the individual to describe how the participant

generally feels. As a result of the scoring made according to the questions that increase and decrease the total anxiety score, the total score is reached by adding a fixed score (50 for the state anxiety score, 35 for the trait anxiety score). The highest score is 80, and the lowest is 20 (13). The higher the total anxiety score, the higher the person's anxiety level filling the scale.

Beck Depression Inventory (BDI)

It is a self-report scale consisting of 21 items that evaluate the risk of depression and the severity of depressive symptoms. Depression degrees can be determined as mild (10-16), moderate (17-29), and severe (30-63) according to the scale score (14).

Death Anxiety Scale

In our research, the death anxiety scale developed by Sarıkaya was used (15). The scale consists of 20 items in a 5-point Likert type. Responses to the scale are scored as 0 points for the "Never" option, 1 point for the "Rarely" option, 2 points for the "Occasionally" option, 3 points for the "Frequently" option, and 4 points for the "Always" option. As a result of the validity-reliability study conducted by Sarıkaya (2013), it was seen that the scale has three sub-dimensions that explain 67.27% of the total variance.

Items numbered 1, 2, 5, 6, 7, 9, 10, 11, 17, and 20 on the scale are "uncertainty of death"; Items numbered 4, 8, 12, 13, 14, 16, and 19 are "thinking about death and witnessing"; Items numbered 3, 15 and 18 are under the 'suffering' factor. The Cronbach alpha reliability coefficient used to determine the scale's internal consistency was found to be 0.95. When the scale is leveled according to the total score, it is defined as 0-12 very low, 13-29 low, 30-47 medium level, 48-60 high, 61-80 very high death anxiety (15).

Statistical Analyze

The data analysis was made in the "SPSS (Statistical Package for Social Sciences) 22.0" package program. The suitability of variables to normal distribution was examined using visual (histogram and probability charts) and analytical (Kolmogorov-Smirnov / Shapiro-Wilk) methods. Since the data did not show a normal distribution, the Mann-Whitney U test compared the State-Trait Anxiety Inventory, Beck Depression Inventory, and Death Anxiety Scale by gender. The Spearman Correlation test was used because the analysis of the State-Trait Anxiety Scale, Beck Depression Scale, and Death Anxiety Scale did not fit the normal distribution. For statistical significance, the total type 1 error level was used as 5%.

Ethical Approval

Study participants were enrolled after obtaining informed consent. Ethical approval was obtained from the Erzurum Regional Training and Research Hospital Clinical Research Ethics Committee (date: 20.05.2020, decision number: 2020 / 10-112). This research was conducted ethically in accordance with the World Medical Association Declaration of Helsinki.

RESULTS

The demographic characteristics of the seventy participants who participated in our study are summarized in Table 1. The majority of the participants were female and were under 40 years old. While 13 people (18.6%) were living alone, 7 people (9.6%) were living at home with their relatives over the age of 65. The majority of the participants were college or university graduates (91%). The intensive care experience of 44 participants (62.9%) was less than 5 years. 84.3% of the participants were working in 3rd step intensive care units.

The median values of state anxiety and trait anxiety scores were 49.5 (IQR: 17) and 40.5 (IQR: 11.75), respectively (Table 2). The median value of the Beck Depression Inventory total score was 11 (min-max: 0-40) (Table 2). While the depression inventory score of 30 (42.8%) of the participants was evaluated as below 10 and no depression, 8 (11.4%) had mild depression according to the depression inventory, and 32 (45.7%) had moderate and severe depression. The median value of death anxiety total score was 33 (2-77) (Table 2). When the death anxiety scale scores are grouped according to the level of death anxiety, 13 people (18.6%) are very low, 17 people (24.3%) are low, 25 people (35.7%) are medium, 8 people (11.4%) are high, and 5 people (7.1%) had a very high level of death anxiety. While state anxiety ($p < 0.001$), trait anxiety ($p = 0.007$), and death anxiety ($p = 0.033$) were observed more in women than in men, no significant difference was observed between genders in terms of depression total score ($p = 0.580$) (Table2).

The correlation between the demographic data and the scales is summarized in Table 3. When we look at the relationship between age and scales, while a negative correlation was observed between death anxiety ($p = 0.025$) and trait anxiety ($p = 0.034$), there was no correlation between state anxiety ($p = 0.219$). A significant positive correlation was found between education level and state anxiety ($p = 0.025$).

Table 1. Demographic Characteristics

	N=70
Age, Year, Median(25-75 Percentil)	28.5 (26-35)
Gender, Male, n(%)	25 (35.7)
Marital Status, Married, n(%)	36 (51.4)
Education Status	
Middle School	1 (1.4)
High Schol	5 (7.1)
University	48 (68.6)
Master Degree	16 (22.9)
Intensive Care Working Time, n(%)	
0-1 year	10 (14.3)
1-5 year	34 (48.6)
5-10 year	20 (28.6)
>10 year	6 (8.6)
Intensive Care Unit Grade, 3rd grade n(%)	59 (84,3)
Household Population, Median (25-75%)	2 (0-8)

Table 2. Comparison of scale scores by gender

	Female	Male	Total	p
STAI Total Score	96 (88.7-110.2)	81.5 (69-86.7)	91 (82-104)	<0.001
State Anxiety Inventory	54 (47.2-61.5)	42 (33.5-46.7)	49.5 (42-59)	<0.001
Trait Anxiety Inventory	42.5 (38-49)	36.5 (34.2-42)	40.5 (36-47.7)	0.007
Death Anxiety Scale	36 (24-44)	19.5 (9.7-39.2)	33 (14.5-43.75)	0.033
Beck Depression Inventory	11 (7-20)	7.5 (3-18.5)	11 (4.75-20)	0.236

STAI: State-Trait Anxiety Inventory, Mann Whitney U

Table 3. Correlation of scales with demographic characteristic, STAI and Death Anxiety Scale

	State Anxiety Inventory	Trait Anxiety Inventory	Death Anxiety Scale
Age			
r	-0.149	-0.255	-0.272
p	0.219	0.034	0.025
Gender: Female			
r	-0.421	-0.326	-0.260
p	<0.001	0.006	0.032
Education Status			
r	0.288	0.072	-0.036
p	0.025	0.556	0.772

STAI: State-Trait Anxiety Inventory, Spearmen Correlation

DISCUSSION

The COVID-19 pandemic has posed serious threats to people's physical health and lives. It has also triggered various psychiatric disorders such as panic disorder, anxiety, and depression. This study it is aimed to measure the level of anxiety and depression in intensive care workers by evaluating the anxiety levels, death anxiety, and depression symptoms of intensive care workers with the increased risk of transmission and increased workload during the COVID-19 pandemic. With this research, it is thought that a concrete basis will be provided for the adaptation and implementation of relevant mental health intervention policies in order to effectively deal with these difficulties by measuring the anxiety and depression burden of intensive care workers.

At the beginning of the COVID-19 pandemic, the state-trait anxiety scores, death anxiety, and depression levels of 70 intensive care workers working in intensive care units of the 3rd stage state hospital were evaluated. In intensive care workers, the state-trait anxiety and death anxiety levels were higher in women. Death anxiety and trait anxiety were found to be negatively correlated with age. In addition, a positive correlation was observed between education level and state anxiety.

In studies conducted during the COVID-19 pandemic, the prevalence of anxiety in healthcare workers was reported to be 20-45% (16-18). In our study, the frequency of intensive care workers with state and trait anxiety scores above 42 and high anxiety levels was found to be 78.5% and 45.7%, respectively. In a study conducted in Taiwan during the SARS pandemic in 2003, the prevalence of anxiety disorder (77.4%) in healthcare workers was relatively high (3). The high frequency of anxiety according to state anxiety has resulted similarly to the mentioned literature.

However, our study is different from other studies reporting anxiety frequency during the COVID-19 pandemic, and the high frequency of anxiety is high. This difference is because the studies include all healthcare workers without considering the intensive care workers with high transmission risk as a separate group.

It has been reported that intensive care workers have higher anxiety levels more frequently than other healthcare professionals due to the need to care for serious and terminally ill patients, the need to make quick decisions, and the frequent execution of interventional procedures that increase the risk of transmission (19). Our study's high frequency of intensive care workers with high anxiety levels seems to be compatible with this literature information.

In our study, when the state-trait anxiety scores were compared by gender, state-trait anxiety scores were higher in females than males. A study examining the community-based psychological responses conducted in China at the beginning of the pandemic stated that being a woman was a risk factor for the development of anxiety and depression (20). In a cross-sectional survey study by Lai et al. with the participation of 1257 healthcare workers in China, it was found that the anxiety levels in female health workers were higher than in men (21). In a study evaluating the state-trait anxiety inventory of healthcare workers during the COVID-19 pandemic in Turkey; the average state anxiety score was found to be statistically higher in females, and although the average trait anxiety score was slightly higher in females than males, this difference was not statistically significant (22). Our study is consistent with the literature, finding that the female gender has higher state-trait anxiety levels than men. This finding may be related to the higher prevalence of anxiety disorders

in women and the genetic predisposition of women to anxiety disorders.

A negative correlation was found between age and trait anxiety in our study. When the literature is examined, in the study by Sakaoglu et al., health workers' state-trait anxiety levels were evaluated during the COVID-19 outbreak, and no correlation was found between age and state-trait anxiety (21). This difference may be due to the increasing professional experience of the intensive care worker with age, reducing anxiety.

When the relationship between education level and anxiety was examined, no significant relationship was found between trait anxiety scores. However, a positive correlation was found between education level and state anxiety. In previous studies on healthcare professionals, some studies found that education level does not significantly affect anxiety scores (22-24). The positive correlation between education level and state anxiety in our study may be related to the high level of COVID-19 awareness among intensive care physicians with high education levels.

Our study evaluated death anxiety as a separate parameter from state-trait anxiety since deaths were reported during the COVID-19 pandemic. Medium and high level of death anxiety was found in 54.2% of the participants. In the literature, in a study evaluating the death anxiety of nurses working in clinics where death events occur frequently, and deaths are not frequent, it was found that the death anxiety of nurses working in clinics where death events are common was found to be significantly high (25). Our study was compatible with the literature about death anxiety.

In our study, death anxiety was significantly higher in females than males. In some studies, death anxiety was found to be higher in women compared to men, while in others, there was no significant difference (26-28). Our study was significantly higher in females than males, findings consistent with the literature.

There was a negative correlation between age and death anxiety. Looking at the studies evaluating the relationship between age and death anxiety, Templer said that there is no relationship between age and death anxiety; many studies emphasized a significant relationship between age and death anxiety (29-34). Most studies report that death anxiety is lower in the elderly compared to adolescents and young adults (35). It has been interpreted that accepting death with the maturity that occurs with advancing age decreases death anxiety (36).

Symptoms of depression were more frequently observed in frontline healthcare workers involved in the diagnosis, treatment, and care of COVID-19 patients (18). In a study by Ozdin et al., the frequency of depression in the Turkish population during the COVID-19 pandemic was 23.5% (37). In a meta-analysis of 13 studies conducted with healthcare professionals during this period, the frequency of depression was 22.9% (38). In our study, the Beck depression inventory score of 57.1% of the participants was above 10. The fact that our study sample

consisted of intensive care workers may be the reason for the higher frequency of depression compared to other studies. In comparing depression scores by gender, no significant difference was found between gender and depression scores in our study. In a study investigating the relationship between the use of personal protective equipment by healthcare professionals and depression during the COVID-19 pandemic in our country; depression scores were evaluated according to gender, and no significant difference was found, and our study was found to be similar to the data of this study (39).

Our study is essential in that it draws attention to the mental health of intensive care workers by evaluating the psychological conditions and related factors of intensive care workers in whom interventions with high transmission risk are applied. One of the main limitations of this study is that the research is cross-sectional and does not provide information about the long-term impact of the pandemic since it was conducted at the beginning of the pandemic. In addition, the lack of structured interview methods in the evaluation of psychiatric diseases, the fact that the study was based on self-report scales, and the low number of participants are the limitations of our study.

CONCLUSION

Intensive care workers underwent a mental burden besides their physical workload during the pandemic. Intensive care workers who work in the diagnosis, treatment, and care process of serious-fatal diseases are more likely to experience anxiety and depression due to the intense stress they experience. Our pioneering research for future studies, supported by multi-centered, structured psychiatric interviews, draws attention to the increased risk of psychiatric diseases, especially in young female intensive care workers, and shows the need for preventive mental health interventions.

Highlight Key Points

- It is observed that the probability of experiencing anxiety, depression, and death anxiety increases due to the intense stress experienced by intensive care workers working in the diagnosis, treatment, and care process of severe-fatal diseases.
- The increased risk of psychiatric diseases, especially among young female intensive care workers, should not be overlooked.
- Planning preventive mental health interventions for intensive care workers can reduce the development of psychiatric diseases in the long term.

Conflict of interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical approval

Approval was obtained from Izmir Bozyaka Training and Research Hospital Ethics Committee for our study on 21/05/2020 with the decision number of 14.

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