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Traumatic Stress and Health Anxiety in Intensive Care Workers During the Covid-19 Pandemic

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Abstract: Intensive care professionals are the individuals who are most exposed to the psychological effects of the COVID-19 pandemic. The aim of the present study was to evaluate and compare the, traumatic stress symptoms and health anxiety in intensive care unit (ICU) workers and non-ICU workers who have been playing an active role in caring for COVID-19 patients. The sociodemographic characteristics of all the healthcare professionals working in the ICU and other units, were recorded. In addition, their history of COVID-19 infection, living with an elderly person, intensive care hospitalization history of relatives, and death status of relatives due to COVID-19 were recorded. The participants were divided into two groups, namely ICU workers and non-ICU workers. The Health Anxiety Inventory (HAI)and the Impact of Event Scale-Revised (IES-R) scales were applied to all the participants. Of the 150 healthcare workers initially identified, 116 agreed to participate in this study. Sixty-nine (59.5 %) of them were working in the ICU, while 47 (40.5 %) were in non-ICU. The mean IES-R score of all participants was 40.19±15.73. When the IES-R scores and ICU results with non-ICUs were compared, the healthcare workers who work in ICU had significantly higher total IES-R scores (42.83±14.65, p<0,01) and sub-scores, including hyperarousal (11.75±5.24, p<0.01), avoidance (14.90±5.52, p<0.01), intrusion (16.17±6.38, p<0.01), than those who does not work in ICU. The HAI scores did not show a significant difference between the two groups (19.59±7.50 for the ICU group vs. 18.40±7.04 for the non-ICU group) (p=0.392). Present study predicts that the COVID-19 pandemic increases traumatic stress, especially in healthcare workers working in ICU. For this reason, psychological assistance is vital to protect healthcare professionals from the acute and long-term effects of trauma. ©2023 NTMS.

Keywords: Health Anxiety; Traumatic Stress; Covıd-19.

1. Introduction

The World Health Organization (WHO) declared COVID-19 to be a pandemic on March 11, 2020, after infections and deaths began to increase exponentially worldwide. The first cases of COVID-19 had been reported during December 2019 in Wuhan, China [1]. The COVID-19 outbreak represents a significant source of traumatic stress that has affected the entire global population and so negatively impacted the

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psychological health of human society. The pandemic has been reported to cause trauma to individuals due to factors such as the uncertainty of its duration and outcome, the lack of fully effective treatment, the lack of consensus as to the general nature of the virus, the number of people infected worldwide, the high mortality rate, the high transmission rate, the fear of death, the losses experienced, the associated economic losses, and the prospect of unemployment [2,3].

Undoubtedly, healthcare professionals are the individuals who are most exposed to the psychological effects of the COVID-19 pandemic. Indeed, healthcare professionals have reported struggling with difficulties such as the increased workload, the risk of themselves and their families being infected, the frequently changing treatment protocols, the lack of protective equipment, the difficult ethical decisions they have to make, and their colleagues becoming infected [4]. Such difficulties increase the psychologic stress experienced by healthcare workers and, therefore, have significant short- and long-term effects on their mental health [5]. It has been found that healthcare workers who directly care for COVID-19 patients have a higher risk of developing psychological stress and symptoms such as anxiety, depression, and post-traumatic stress disorder (PTSD) [6,7]. COVID-19, as a new disease whose etiology and pathology remains unknown, has a high mortality rate and no effective treatment, which increases the symptoms of PTSD experienced by the healthcare workers having to deal with it [8].

PTSD involves the development of specific negative symptoms following exposure to one or more traumatic events. It is a mental health condition characterized by hyperarousal, avoidance, and intrusive memories [9].

Health anxiety involves the belief that the individual has a serious illness, which stems from the misinterpretation of somatic symptoms or the fear of catching a disease. Regardless of its classification, severe health anxiety has significant negative impacts on the individual's well-being, social and occupational functioning, and healthcare resource utilization. More anxiety and increased mental dysfunction have been identified during the COVID-19 pandemic in individuals with severe health anxiety [10].

There is no study that we are aware of that compares the psychological challenges faced by medical staff caring for COVID-19 patients in the ICU and other departments. The aim of the present study was to evaluate and compare the PTSD symptoms and health anxiety in intensive care unit (ICU) workers and non-ICU workers who have been playing an active role in caring for COVID-19 patients.

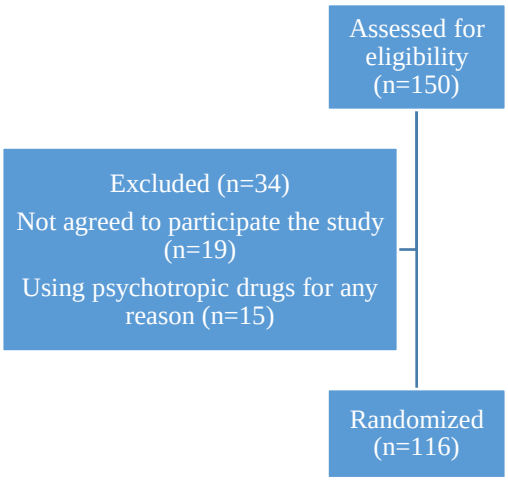
2. Material and Methods

This study was conducted in accordance with the Helsinki Declaration's ethical standards. Moreover, informed consent was obtained from all the participants.

2.1. Participants

This study was conducted in Sakarya University, which was designated a pandemic hospital by the Turkish Ministry of Health between November 2020 and December 2020. As such, the hospital is actively involved in the care of COVID-19 patients. Healthcare professionals who had been involved in the treatment of COVID-19 patients for at least three months were included in the present study.

Some 116 healthcare workers out of 150 healthcare professionals working at the hospital were included in this study. Post hoc power analysis was performed to assess the adequacy of the sample size of the study. In the power analysis, it was determined that the power was 0.99 at a significance level of 0.05 and a confidence interval of 95% (Correlation H1=0.717, lower critical r=-0.112, Upper Critical r=0.112, power 0.99). This value indicated that the sample size was adequate[11].



2.2. Data collection and study design

The sociodemographic characteristics of all the healthcare professionals working in the ICU and other units, including their age, gender, smoking and alcohol use, regular medical treatment, and chronic systemic disease history, were recorded. In addition, their history of COVID-19 infection, living with an elderly person, intensive care hospitalization history of relatives due to COVID-19, and death status of relatives due to COVID-19 were recorded.

The participants were divided into two groups, namely ICU workers and non-ICU workers. The non-ICU group comprised healthcare professionals who worked in outpatient clinics, inpatient services, and operating rooms. The Health Anxiety Inventory (HAI) scale was applied to all the participants to determine their level of health anxiety, while the Impact of Event Scale-Revised (IES-R) was used to evaluate their trauma.

The HAI was developed by Salkovskis et al. to assess health anxiety [12]. It is a self-report scale consisting of 18 items. The first 14 items of the scale consist of statements with four sequential answers that question the mental state of the patient. In terms of the remaining four questions, patients are asked to consider what their mental state might be if they had a serious illness, and

they are then questioned accordingly. The scoring of the scale is between zero and three for each item, with a high score indicating a high level of health anxiety [13]. The highest possible score for the scale is [54].

The IES-R is a 22-item self-report scale developed to measure the subjective tension and strain caused by traumatic events. Weiss and Marmar [14] rearranged the scale initially developed by Horowitz et al. [15], and their scale was adapted into Turkish by Corapcioglu et al. [16]. In the scale, the hyperarousal subscale includes six items, while both the avoidance and reliving subscales consist of eight items. Each symptom included in the scale is scored on a five-point Likert scale ranging from "none" to "very much" based on the frequency of its occurrence during the last week. The lowest and highest scores for the scale range from 0-88.

2.3. Statistical Analysis

Descriptive analysis of the variables was expressed as Mean±SD in normal distribution, and parameters with abnormal distribution were expressed as median of the 25^{th}-75^{th} percentile (interquartile range). Categorical data are expressed as proportions. The chi-square and the Student's t-test were used for categorical and continuous variables, respectively. Fisher's exact test was applied in analysing small samples. For continuous variables, differences between the two groups were evaluated using the Student's t-test when data were normally distributed and the Mann-Whitney U test when the assumption of normality was not met. Binary logistic regression analysis was performed to determine independent factors associated with mortality. A P-value less than 0.05 was considered statistically significant. Statistical analyses were performed using statistical software (SPSS 20.0, IBM Corporation, Armonk, Chicago, IL, USA).

3. Results

Sociodemographic and clinical characteristics of 116 healthcare professionals participating in the study are shown in Table 1.

Participants were divided into two groups according to their workplace as ICU workers and non-ICU workers. Sixty-nine (59.5 %) of them were working in the ICU, while 47 (40.5 %) were in non-ICU. Table 2 demonstrates the IES-R and HAI scores of both groups. The mean IES-R score of all participants was 40.19±15.73.

Table 1: Sociodemographic and clinical features of the participants.

	n=116
Age (year)	30.18±6.79
Gender, n (%)	
Female	71 (61.2)
Male	45 (38.8)
Occupation, n (%)	
Physician	31 (26.7)
Nurse	81 (69.8)
Technician	4 (3.4)
Marital Status, n (%)	
Married	64 (55.2)
Single	52 (44.8)
Smoking, n (%)	50 (43.1)
Alcohol consumption, n (%)	17 (14.7)
Presence of comorbidity, n (%)	13 (11.2)
Cohabit with elderly, n (%)	11 (9.5)
Recovered from Covid-19, n (%)	17 (14.7)
Relative died due to Covid-19, n (%)	29 (25.0)
Workplace, n (%)	
Intensive Care Unit	69 (59.5)
Other departments	47 (40.5)

When the IES-R scores and ICU results with non-ICUs were compared, the healthcare workers who work in ICU had significantly higher total IES-R scores (42.83±14.65, p<0.01) and sub-scores, including hyperarousal (11.75±5.24, p<0.01), avoidance (14.90±5.52, p<0.01), intrusion (16.17±6.38, p<0.01), than those who does not work in ICU.

Forty-eight (76.2 %) ICU workers and 19 (69.9 %) non-ICU workers received a score of 24 or higher, indicating the fulfilment of diagnostic criteria for PTSD. The HAI scores did not show a significant difference between the two groups (19.59±7.50 for the ICU group vs. 18.40±7.04 for the non-ICU group) (p=0.392).

Sociodemographic characteristics for PTSD were evaluated by binary logistic regression analysis as independent risk factors. Female gender [OR: 0.143 %95 CI: 0.021-0.989 p=0.049], working in ICU [OR: 0.019 CI: 0.002-0.154 p<0.01], cohabit with elderly [OR:15.599 CI:2.092-116.3 p<0.01], alcohol consumption [OR:0.041 CI:0.002-0.769 p=0.033] were identified as risk factors for PTSD. Age, occupation, marital status, being recovered from COVİD-19, having a relative died due to COVİD-19, and smoking

habit was not found predictor for PTSD (Table 3). Sociodemographic characteristics (Gender, age, workplace, cohabit with elderly, alcohol consumption, occupation, marital status, being recovered from COVID-19, having a relative died due to COVID-19, smoking) and IES-R scores for HAI were evaluated by binary logistic regression analysis as independent risk factors and none were found to be predictors of health anxiety.

Table 2: IES-R Scores in ICU Personnel and Non-ICU Personnel.

	Total n=94	ICU Personnel n=69	Non-ICU Personnel n= 47	*P**
IES-R Intrusion	14.94±6.68	16.17±6.38	11.15±6.5	<0.01
IES-R Avoidance	14.37±5.83	14.90±5.52	10.30±5.39	<0.01
IES-R Hyperarousal	10.88±5.36	11.75±5.24	7.53±4.66	<0.01
Total IES	40.19±15.73	42.83±14.65	28.94±13.62	<0.01
HAI-1	15.0±5.77	15.48±5.94	14.77±5.86	0.525
HAI-2	4.14±2.72	4.12±2.86	3.64±2.26	0.341
Total HAI	19.77±7.27	19.59±7.50	18.40±7.04	0.392

IES-R= Impact of Events Scale–Revised, HAI: Health Anxiety Inventory. *: ICU personnel vs non-ICU personnel. P<0.05 statistically significant. Mean±Standard Deviation, *Student's t-test.

Table 3: Independent factors associated with PTSD using binary logistic regression analysis.

	Exp (B) (Odds Ratio)	95% Confidence Interval	*p*
Age	1.044	0.951-1.146	0.370
Gender (female vs male)	0.143	0.021-0.989	0.049*
Occupation	13.404	0.132-1359	0.134
Work place (ICU-non-ICU)	0.019	0.002-0.154	<0.01*
Marital status (single vs married)	0.932	0.973-1.034	0.934
Cohabit with elderly (yes vs no)	15.599	2.092-116.3	<0.01*
Recovered from covid-19 (yes vs no)	0.184	0.017-2.039	0.168
Relative died due to covid-1 (yes vs no)	0.895	0.220-3.646	0.877
Smoking (yes vs no)	3.689	0.866-15.70	0.077
Alcohol consumption (yes vs no)	0.041	0.002-0.769	0.033*

*: p<0.05 was considered statistically significant. Mean±Standard Deviation. Binary logistic regression analysis.

4. Discussion

As a result of our study, the healthcare workers who work in ICU had significantly higher total IES-R scores and sub-scores, including hyperarousal, avoidance and intrusion than those who does not work in ICU. However, the HAI scores did not show a significant difference between the two groups.

Psychiatric trauma can occur if there is an imbalance between the stressful event and the capacity to cope with it psychologically [17]. It has been reported that pandemics also had traumatic effects on the society in the past, and the symptoms of acute stress disorder and PTSD increased during pandemic periods [18]. During the COVID-19 pandemic, it has been shown that the prevalence of PTSD has increased worldwide, especially for healthcare professionals [2,3]. Looking at the effects of the Covid-19 pandemic, especially at the mental health of healthcare workers, it has been shown that the most affected group is front line workers. In similar studies, healthcare workers who cared for primary COVID-19 patients and second line workers were compared, and it was shown that anxiety, depression and traumatic symptoms were higher on the front line [19-21].

A study conducted in France showed that 27% of healthcare workers who treat COVID-19 patients in ICU had PTSD symptoms [22].

There are studies reporting that PTSD is seen at higher rates in intensive care nurses than nurses working in other departments [23, 24]. We attribute the higher incidence of PTSD symptoms in nurses than doctors and technicians, to the fact that they spend more time with patients and therefore they may be more likely to establish emotional bonds with patients.

It is known that nurses working in the ICU provide care to patients who are clinically worse, therefore have witnessed deaths of many patients [25]. Participation in a resuscitation can create an increased level of psychological stress. New research suggests that PTSD in resuscitation providers at baseline is 9.6% [26]. In our study, the IES-R scores and sub-scores of the healthcare workers working in the ICU were found to be statistically higher than the non-ICU workers.

Although all healthcare workers are affected during the pandemic process, the group with front liners has a higher risk of PTSD due to witnessing all phases of COVID-19 disease. When the patients in ICU who died before the pandemic generally used to be were older in

age, now the loss of younger patients, ICU staff witnessing the long-term relationships they have made deteriorate, patients dying without making their farewells to their loved ones and ICU staff being the ones breaking the news to their families and feeling the guilt from it, high contamination risk from long periods of physical contact, long hours of work and living isolated because the risk of infecting other people are the reasons why we think ICU staff have more traumatic stress.

In this study, depression, anxiety and health anxiety levels were higher in women, showing that the psychiatric impact during the COVID-19 pandemic may be greater on women. Several previous studies have shown that female gender has been identified as a predictor of PTSD symptoms after pandemics [19, 20]. In our study, being a female was determined as a risk factor for the development of PTSD.

Different from the study of Lai et al in our study, age was not determined as a risk factor for PTSD development. However, in Turkey, a high proportion of the elderly population (22.6%) live in extended family, thus identifies as a risk factor in our study for development of PTSD among healthcare workers [27]. Those living with elderly are at higher risk of developing PTSD due to the fear of these workers to infect their family members. In our study we found a positive association between PTSD and alcohol consumption, in past studies this relationship was commonly explained by using alcohol to cope with unpleasant symptoms of PTSD [28, 29].

There are few studies in the literature examining the relationship between health anxiety and COVID-19 pandemic. In COVID-19 pandemic, the average HAI score in the general population in Germany was found to be 14.68±6.58 [29]. In another study the average HAI score in the Turkish general population during the COVID-19 pandemic was found to be 15.1±7,0 [30]. In our study, HAI scores were found to be higher than these studies (19.77±7.27).

When the relationship between knowledge about the virus and health anxiety is examined;

Blakey and Abramowitz (2017) and Lei et al. (2020) found that a higher level of knowledge about the virus is associated with increased anxiety [31, 32]. Furthermore In a study recently reported in Turkey, it was found that stress status along with anxiety in healthcare workers during COVID-19 was significantly higher and significantly impaired the quality of life[33]. In this respect, higher HAI scores in our study can be interpreted as all participants in our study were healthcare workers and had more knowledge about COVID-19 than the general population.

Although HAI scores were found to be high in our study, sociodemographic characteristics were not found to be an independent risk factor for health anxiety. Unlike our study, in the study of Ozdin et al., female gender, accompanying chronic disease and previous psychiatric history were found as risk factors for health anxiety [30].

There were several limitations in the present study. First, low number of participants in a single center enrolled in this study which can cause higher variability. Second, the cross-sectional nature of the study is not appropriate to assess the direction of causation. Third, use of self-rating scales in this study which may cause biased entries. Fourt, healthcare professionals were not evaluated in subcategories. Last limitation is that no comparison was made between the ICU workers in COVID-19 intensive care unit and ICU workers in non-COVID-19 intensive care unit.

5. Conclusion

In conclusion, present study was the first to assess health anxiety in healthcare workers during the current COVID-19 outbreak. We predict that the COVID-19 pandemic increases traumatic stress, especially in healthcare workers working in ICU. For this reason, psychological assistance is vital to protect healthcare professionals from the acute and long-term effects of trauma. Furthermore, other long-term studies are needed to evaluate the psychiatric effects of the pandemic on healthcare workers.

Limitations of the Study

The limitations of this study are that the cross-sectional nature of the study is not appropriate to assess the direction of causation and use of self-rating scales in this study which may cause biased entries.

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Conflict of Interests

The authors declared no conflict of interest.

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Author Contributions

ED and HK designed the research. ED participated in data collection and data analysis. ED and HK wrote the manuscript, read and approved the final script.

Ethical Approval

This study was approved by the clinical research ethics committee of the Sakarya University. Date: 02.03.2021 number: E14837.

Data sharing statement

The material used in the study and without the permission of the authors.

Consent to participate

Not applicable.

Informed Consent

The authors accept their responsibilities in the study.

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