ORIGINAL ARTICLE

Research on the frequency of post-traumatic stress disorder in healthcare workers during the COVID-19 pandemic

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Abstract

Background It is highly probable that the COVID-19 outbreak, one of the most severe pandemics to which humanity has been exposed, will promote post-traumatic stress disorder (PTSD). PTSD is a serious mental illness that decreases quality of life and functionality of healthcare workers (HCWs) during the COVID-19 pandemic.

Aims This study aims to research the frequency of PTSD in HCWs who are working in a central pandemic hospital, during the COVID-19 outbreak.

Methods In total, 300 HCWs were included in the study. Diagnosis of PTSD was made according to DSM-5 diagnostic criteria, and the severity of PTSD symptoms was evaluated using the PTSD Checklist – Civilian Version Scale.

Results In total, 21.6% ($n = 65$) of the HCWs were diagnosed with PTSD, 18.3% of them were female ($n = 55$) and 3.3% were male ($n = 10$) participants. The mean PCL-C score of participants diagnosed with PTSD was found to be 60.38 ± 4.81. No statistically significant difference was found between profession groups diagnosed with PTSD.

Conclusions HCWs who are working directly with COVID-19 patients have significantly higher levels of PTSD. PTSD can lead to severe negative consequences such as lower quality of life and loss of workforce and productivity, if it is not diagnosed and treated early. Therefore, it should become a routine to continuously monitor and establish early targeted mental health interventions.

Keywords COVID-19 · Healthcare workers · Post-traumatic stress disorder

Introduction

COVID-19 (coronavirus disease-19) was first detected in a province in China in December 2019 and then spread rapidly in many regions of China and from there to almost all countries in the world. COVID-19 was declared a pandemic (global epidemic) by the World Health Organization on March 11, 2020 [1]. Mental symptoms due to increasing workload and responsibility of HCWs (healthcare workers) are excessively increasing in the COVID-19 pandemic similar to previous pandemics. While HCWs are heroically fighting against the pandemic, they also have to fight against the psychological effects of an outbreak. Since the first cases of COVID-19 (coronavirus-19 disease) have emerged in China on December 8, 2019, the disease has rapidly spread

to the entire world with more than one hundred thousand cases and thousands of deaths [2]. Post-traumatic stress disorder (PTSD) is a common mental disorder among people who experienced a serious trauma such as war, violence, natural disaster, traffic or occupational accident, and fatal communicable disease epidemic. It is a mental disorder characterized with constantly reliving the stated situation, negative changes in cognition and mood, constant avoidance from stimulus accompanying the trauma, and accompanying signs of increased arousal which starts following a traumatic (destructive) incident and continues for at least 1 month. The symptom of the disease starts after the traumatic incident and continues for more than 1 month [3]. Many HCWs experience severe emotional stress during the pandemic. A relevant study reported that the thought of carrying the virus and possibility of worrying about infecting other people were higher among HCWs during the SARS pandemic [4]. Another risk for many HCWs is the behavior of avoidance. It has been seen that HCWs displayed avoidance behaviors such as minimizing direct contact with patients

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and not going to work regularly [5]. Extraordinary epidemics caused PTSD in the past [6, 7]. Considering that humanity is facing the most severe pandemic since the Spanish Flu, it is possible that the current COVID-19 pandemic will also cause PTSD [8]. This study aimed to assess the prevalence and predictive factors of post-traumatic stress among HCWs who worked in a pandemic hospital during the COVID-19 outbreak.

Methods

Study population

The study was conducted between 15 July 2020 and 15 October 2020 with a cross-sectional design. The participants were 300 HCWs who were working at a hospital, which was determined to be a pandemic hospital in Turkey. From the formula of "the number of samples in groups with a certain number in the universe," the prevalence of PTSD was considered 20% during epidemic periods in previous population-based studies, and the lower limit number of samples to be selected from the population was calculated as 271, with a 95% confidence interval and a margin of error of 0.05. HCWs were evaluated into six major occupational groups and 50 people were randomly selected from each occupation equally. A sample of 300 HCWs was determined from the population of 2037 numbered by the cluster sampling method. Interviews were made with those who agreed to participate in this study, and sociodemographic data form and SCID-5 were filled. After psychiatric interviews were made with all participants, the evaluation scales were implemented. The diagnosis of PTSD was made based on the diagnosis criteria of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) [3], and those with severe PTSD symptoms were evaluated with the "Post-Traumatic Stress Disorder Checklist – Civilian Version" (PCL-C). Those with comorbid psychiatric diagnoses and those who used and were using psychotropic medication within the last 1 month were not included in the study. The participants were informed about the study in detail and their informed consent forms were obtained before conducting the study. Ethics committee approval was obtained for the study and it was conducted in accordance with the principles stated in the Declaration of Helsinki.

Data collection tools

Personal information form

The form prepared by the researchers included age, sex, marital status, profession, and other sociodemographic characteristics and clinical characteristics.

The Structured Clinical Interview for DSM-5 Clinical Version (SCID-5-CV)

The scope of SCID-5 has expanded with changes in diagnostic categories, and its function to prevent diagnosis uncertainty and missed diagnosis has been further strengthened compared to its previous version. It has been supported that this new form is easy to apply and is useful for clinical assessments, studies, and training. It has been shown that SCID-5 can safely be used in Turkey [9].

The Post-Traumatic Stress Disorder Checklist – Civilian Version (PCL-C)

PCL-C was firstly developed based on the DSM-III PTSD diagnosis criteria, and it was reviewed after the DSM-IV and found to be valid [10]. It is a self-reporting scale with 17 items in a Likert-type structure. The first five questions show the signs of reliving, the following seven questions show the signs of avoidance, and the next five questions show the signs of increased arousal. The answers change between "none" [(0)] and "extremely" [(5)]. The PCL-C test has been successfully used to measure the PTSD symptoms of civil trauma patients [11]. It was found in relevant studies that the optimal screening cutoff score is between 31 and 50 [12–14]. In another study, test results based on the PCL-C cutoff score of 30, 38, 44, 50, and 60 were evaluated, and it was found that sensitivity decreased as the cutoff score increased and specificity increased as the cutoff score increased in terms of the PTSD diagnosis [10]. The Turkish validity and reliability studies of the scale were conducted and it was shown that it is a tool that can be used both in PTSD screening and evaluation of the severity of PTSD [15].

Statistical analysis

The statistical analysis of the data obtained from the study was conducted with SPSS 21.0 program. Descriptive statistics were presented as mean ± standard deviation. The differences between means were regarded as statistically significant when the p value was lower than 0.05.

The difference between mean ages in terms of gender was analyzed with the independent samples T-test. The difference between those diagnosed with PTSD in terms of gender, education status, marital status, profession, living at home, having a history of psychiatric disease, having a family history of psychiatric disease, and having a chronic disease was analyzed with the chi-square test.

PCL-C mean score difference between participants diagnosed with PTSD and not diagnosed with PTSD was analyzed by an independent samples T-test. The difference between mean PCL-C scores in terms of gender, education status, marital status, living at home, having a history of

psychiatric disease, having a family history of psychiatric disease, and having a chronic disease was analyzed with the independent samples T-test. The difference between profession groups was analyzed with the one-way ANOVA test.

Results

The study included 130 male and 170 female HCWs aged between 21 and 61. HCWs were divided into six groups as doctor, nurse, secretary, security guard, health officer, and cleaning-cafeteria staff. Each group included the same numbers of participants in a way that the groups are similar for the homogeneity. The mean age of female participants was 37.74 ± 8.15 while the mean age of male participants was 37.15 ± 9.61. There was no statistically significant difference between female and male participants in terms of age ($p = 0.573$). Of the participants, 21.6% ($n = 65$) were diagnosed with PTSD, and 18.3% of them were women ($n = 55$) while 3.3% were men ($n = 10$). In the study, 32.4% of female participants were diagnosed with PTSD and 7.7% of male participants were diagnosed with PTSD and there was a statistically significant difference in terms of gender ($p = 0.001$). There was no statistically significant difference found between the participants diagnosed with PTSD in terms of education, profession, having a history of

psychiatric disorder, and having a chronic disease (respectively $p = 0.779$, $p = 0.138$, $p = 0.487$, $p = 0.257$). There was a statistically significant difference in terms of marital status, living at home, and having a family history of psychiatric disorder (respectively $p = 0.015$, $p = 0.001$, $p = 0.013$) (Table 1).

The mean PCL-C score of the participants was 41.50 ± 13.19. While the mean PCL-C score of the participants without the diagnosis of PTSD was 36.27 ± 9.47, the mean PCL-C score of the participants diagnosed with PTSD was 60.38 ± 4.81. The mean PCL-C scores were found to be significantly higher in those diagnosed with PTSD ($p = 0.001$). The mean PCL-C score was 45.11 ± 14.62 among women and 36.76 ± 9.16 among men. The mean PCL-C score was found to be significantly higher in women ($p = 0.001$).

The mean PCL-C score of those diagnosed with PTSD was 61.45 ± 4.45 among women and 54.5 ± 0.52 among men. The mean PCL-C score of those diagnosed with PTSD was found to be significantly higher in women ($p = 0.001$).

There was no statistically significant difference between the mean PCL-C scores of the participants in terms of education, marital status, living at home, having a history of psychiatric disorder, and having a family history of psychiatric disorder (respectively $p = 0.419$, $p = 0.313$, $p = 0.106$, $p = 0.113$, $p = 0.108$). There was a statistically significant

Table 1 Comparison of sociodemographic characteristics between participants diagnosed with PTSD and without PTSD

		Diagnosed with PTSD (n) (%)	Not diagnosed with PTSD (n) (%)	Total (n) (%)	p
Gender	Male	10 (% 3.3)	120 (% 40)	130 (% 43.3)	$p = 0.001$
	Female	55 (% 18.3)	115 (% 38.3)	170 (% 56.7)	
Marital status	Married	50 (% 16.7)	145 (% 48.3)	195 (% 65)	$p = 0.015$
	Single	15 (% 5)	90 (% 30)	105 (% 35)	
Graduated university	Yes	30 (% 10)	115 (% 38.3)	145 (% 48.3)	$p = 0.779$
	No	35 (% 11.7)	120 (% 40)	155 (% 51.7)	
Living at home	Alone	5 (% 1.7)	60 (% 20)	65 (% 21.7)	$p = 0.001$
	Not alone	60 (% 20)	175 (% 58.3)	235 (% 78.3)	
Having a history of psychiatric disorder	Yes	15 (% 5)	45 (% 15)	60 (% 20)	$p = 0.487$
	No	50 (% 16.7)	190 (% 63.3)	240 (% 80)	
Having a family history of psychiatric disorder	Yes	15 (% 5)	25 (% 8.3)	40 (% 13.3)	$p = 0.013$
	No	50 (% 16.7)	210 (% 70)	260 (% 86.7)	
Having a chronic disease	Yes	5 (% 1.7)	70 (% 23.3)	75 (% 25)	$p = 0.257$
	No	60 (% 20)	165 (% 45)	225 (% 75)	
Profession	Doctor	10 (% 3.3)	40 (% 13.4)	50 (% 16.7)	$p = 0.138$
	Nurse	12 (% 4)	38 (% 12.7)	50 (% 16.7)	
	Secretary	11 (% 3.7)	39 (% 13)	50 (% 16.7)	
	Security	11 (% 3.7)	39 (% 13)	50 (% 16.7)	
	Health officer	10 (% 3.3)	40 (% 13.4)	50 (% 16.7)	
	Cleaning-cafeteria staff	11 (% 3.7)	39 (% 13)	50 (% 16.7)	

PTSD post-traumatic stress disorder

difference in terms of having a chronic disease ($p = 0.003$). Variance analysis was performed to determine whether the mean PCL-C scores were different according to profession groups and a statistically significant difference was found ($F = 9.248$; $p = 0.001$). Comparison of mean PCL-C scores is shown in Table 2.

Discussion

The aim of this study was to examine the frequency of PTSD among HCWs during the COVID-19 pandemic. HCWs, who are at the forefront during pandemics, are at risk in terms of mental disorders. Worries about the infection, feeling of tiredness, feeling of burnout in the workplace, and PTSD can be seen among HCWs. The fact that the contamination speed of the COVID-19 is fast and the contamination is easy is considered as a major stressor that causes negative effects on the mental health of HCWs. It is stated that this stress is an important risk factor for PTSD among HCWs [16]. Perceived danger, uncertainty, and uncontrollability perceptions during the previous SARS pandemic were reported to increase the incidence possibility of PTSD among individuals [17]. A relevant study determined that 25% of HCWs experienced PTSD during the SARS and Ebola periods [18]. A recent study reported that the rate of PTSD cases was 21% after the Ebola outbreak [19]. The number of studies about PTSD conducted with HCWs is relatively low. A study conducted with doctors and nurses 2 months after the emergence of the SARS outbreak in 2004 found that the prevalence of PTSD was 20% [20]. Regarding the current COVID-19 pandemic, a study conducted in China investigated 230 members of the medical staff. The incidence of PTSD was

estimated at 27.39% [21]. In this study, the rate of HCWs diagnosed with PTSD was found 21.6%. As in other mental illnesses, early diagnosis increases the possibility of cure in PTSD. Relevant studies showed that PTSD symptoms last more than 6 months after an incident and have a high possibility of continuance in the long term [22]. Another study has found that more than three-quarters of those who were diagnosed with PTSD right after the disaster and who were not treated were diagnosed with PTSD once again after 1 year [23]. Mak et al. (2009) conducted a study for 30 months after the SARS outbreak and found the prevalence of PTSD among the SARS victims in Hong Kong as 25.6%, and this rate was higher than the rate at the beginning of the outbreak similar to the present study and relevant studies [24]. Therefore, the earlier the PTSD is diagnosed and treated, the higher the chance of the recovery of one's mental health. The sociodemographic characteristics of individuals diagnosed with PTSD were examined and possible risk factors were tried to be determined in this study. Of the HCWs who were diagnosed with PTSD, 32.4% are within female participants and 7.7% are within male participants, and there was a significant difference in terms of gender. So PTSD was more common in women HCWs in our study.

In the study, it was found that PTSD was higher in HCWs who are married and not living alone at home. This result shows that HCWs are concerned about their families than themselves during the pandemic. In parallel with this result found in another study, one of the risks of having PTSD for HCWs is the fear of transmitting the infection to family, relatives, and friends [25].

In the study, there was no significant difference between the profession groups among those diagnosed with PTSD. On the other hand, the mean PCL-C score of nurses was

Table 2 Comparison of mean PCL-C scores

		The mean PCL-C score ($m \pm$ sd)	p
Gender	Female	45.11 ± 14.62	$p = 0.001$*
	Male	36.76 ± 9.16	
	Total	41.50 ± 13.19	
Diagnosed with PTSD	Yes	60.38 ± 4.81	$p = 0.001$*
	No	36.27 ± 9.47	
Profession	Health officer	33.7 ± 9.17	$p = 0.001$**
	Secretary	42.7 ± 12.23	
	Security	39.1 ± 12.94	
	Cleaning-cafeteria staff	44.2 ± 14.28	
	Nurse	49.4 ± 16.89	
	Doctor	40.4 ± 13.47	
Having a chronic disease	Yes	54.3 ± 13.49	$p = 0.003$*
	No	42.1 ± 9.27	

*T-test, **ANOVA; *PTSD* post-traumatic stress disorder, *PCL-C* Post-Traumatic Stress Disorder Checklist – Civilian Version, *sd* standard deviation

significantly higher than that of other HCWs. Therefore, it was concluded that HCWs in this group were at higher risk of having PTSD. This result can be interpreted as traumatic stress is higher in HCWs who are in closer contact with risky people. Additionally, the mean PCL-C score was significantly higher in HCWs who have a chronic disease. This result can be explained as the traumatic stress caused by the fact that the COVID-19 is more fatal in chronic diseases.

This study has some limitations. First, because of the cross-sectional design of the study, the results show the psychological impact within the limited period of the pandemic. Another limitation is that it was conducted in a single center and the sample size was relatively small. Future studies will provide more comprehensive information about protecting the mental health during and after the COVID-19 pandemic with the elimination of these types of limitations.

This study will make a significant contribution to the literature in this important area, which a few studies have been done. It is very important that PTSD may lead to negative consequences such as lower quality of life, loss work force, and loss of productivity among HCWs because HCWs, who are fighting against the pandemic at the forefront and at high risk, break down both physically and mentally in time. For this reason, precautions should be taken by healthcare administrators to protect the mental health of HCWs. HCWs should have easy access to psychiatric support and treatment when needed. In addition, considering that the pandemic will continue for a long time, this process should be sustainable.

Declarations

Ethics approval All procedures performed in studies involving human participants 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.

Conflict of interest The author declares no competing interests.

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