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Evaluation of the Frequency of Post-traumatic Stress Disorder in Patients with COVID-19 Admitted to Hospitals in Sari, Iran in 2020

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Abstract

Backgrounds: The COVID-19 epidemic has affected people's mental health around the world. According to previous epidemics, an increase in post-traumatic stress disorder (PTSD) has been seen until one year later.
Objectives: Due to the importance of psychological issues secondary to COVID-19, in this study, the frequency of PTSD symptoms in the follow-up of patients with COVID-19 who were hospitalized in Sari was evaluated.
Methods: In this cross-sectional study, 199 patients diagnosed with COVID-19 who were hospitalized in Sari were identified, and patients' records were recorded. PTSD criteria were assessed based on the PTSD Checklist for DSM 5 (PCL-5). Data were analyzed using SPSS 16.
Results: In the present study, the overall prevalence of PTSD was 19.1% (38 patients). The frequency of PTSD was higher in women, married people, people with children, and those aged 20-44 years. The prevalence of PTSD was higher in 29 patients (38.2%) with higher education.
Conclusions: This study showed that PTSD has a high prevalence in people with a history of COVID-19, and it is necessary for these patients to undergo psychiatric evaluations.

Keywords: COVID-19, Post-traumatic Stress Disorder, Psychiatric Complications

1. Background

Infectious diseases are regarded as the most significant public health threat all over the world in the 21st century (1). Upon the outbreak of the novel coronavirus infection (coronavirus disease 2019 (COVID-19)), the constant influx of information and some concerns in this respect have influenced mental health conditions worldwide. The psychological burden of this pandemic has been thus a major challenge facing patients, the general population, policy-makers, and healthcare workers (HCWs) (2). Previous research has also demonstrated that the mental health needs of patients with confirmed or suspected COVID-19, family members of quarantined cases, and HCWs have not yet been adequately managed (3, 4). Uncertainties about the disease and social issues, such as quarantine, have accordingly caused anxiety and fear. Some significant psychiatric disorders, such as post-traumatic stress disorder (PTSD), depression, panic attacks, and behavioral problems, are likely to arise in such situations. Accordingly, being away from family, a sense of loneliness, access to false and misleading content in the media, economic insecurity, and exposure to stigmatization are factors predisposing individuals to psychiatric problems during this period (5, 6). Even though people tend to demonstrate positive resilience more often following traumatic events, there are some risk factors, making it difficult for them to adapt and bounce back, such as a history of mental illnesses, female gender, lack of social support, having young children, and feelings of helplessness or high-intensity emotions, e.g., anger (7).

2. Objectives

The etiology of psychological problems after being exposed to COVID-19 is multifactorial, and there are even several factors, including the direct impact of the virus on the brain (viz. brain infections), cerebrovascular involvement,

physiological involvement (such as hypoxia), the immune response, therapeutic interventions, social isolation, and mental health consequences of the novel disease that can give rise to major stigmas. Survivors of critical illnesses are also at risk for chronic psychiatric disorders. For example, the prevalence rate of PTSD has been estimated at 34% in several studies one year after the onset of severe viral diseases. In this sense, PTSD refers to a set of signs and symptoms associated with the influence of thoughts and feelings, avoidance, mood swings, cognitive changes, as well as arousal and reactivity that are likely to occur following traumatic events. Retrospective studies have further shown that PTSD symptoms are associated with emotion regulation impairment, which helps people know what feelings and emotions they have and even when and how they experience and express them (8). Among individuals not meeting the diagnostic criteria, PTSD symptoms can be associated with reductions in performance. In this regard, the most common long-term problem had been PTSD in studies on psychiatric disorders among survivors of severe acute respiratory syndrome (SARS) (1). According to previous data on epidemics, the prevalence rate of PTSD grew by 42% one year after the outbreak of the Middle East respiratory syndrome (MERS) and by 26% up to 30 months after SARS (9). With regard to the results of studies on COVID-19, having PTSD after contracting the virus can lead to a decline in the quality of life and job performance (10). Given the importance of psychological issues secondary to the COVID-19 pandemic with unclear consequences and the PTSD symptoms in this population, the present study was done to investigate the frequency of PTSD in patients with COVID-19 admitted to the hospitals in Sari, Iran.

3. Methods

3.1. Participants

In this cross-sectional study, the patients admitted to the hospitals based in Sari, Iran, with the diagnosis of COVID-19 were identified. After accessing their medical records from two university hospitals and a private one, the patients' demographic information was recorded.

3.2. Sample Size

The sample size in this study was estimated based on the results of a similar survey (1), wherein the prevalence rate of PTSD was 47.8%. Also, considering the confidence interval (CI) of 95%, the precision rate of 0.07, and the below ratio estimation formula, a total number of 196 individuals was finally estimated.

$$n = \frac{Z^2 P (1 - P)}{d^2} \quad (1)$$

For sampling purposes, the random sampling technique was practiced. The list of the patients affected with COVID-19 was also retrieved in terms of their hospitalization date and time (from the first case admitted to the hospitals to those diagnosed at the onset of the study).

3.3. Research Procedure

The inclusion criteria for sample selection were a history of diagnosis of COVID-19 at least in the last month, a history of admission to the hospitals in Sari, Iran due to COVID-19, and the age over 18 at the time of contracting the virus. On the other hand, the exclusion criteria were patients with severe communications problems (hearing loss, dementia, and mental retardation).

The infected patients were contacted through making phone calls by a psychiatrist. The objectives of the study were explained to the patients. Patients were assured that their information would be kept confidential. The PTSD criteria were thus measured based on the demographic characteristic's questionnaire and the PTSD Checklist for the diagnostic and statistical manual of mental disorders, fifth edition (DSM-5) (PCL-5).

3.4. Instruments

3.4.1. PCL-5

The PCL-5 contains items to evaluate the PTSD symptoms in affected patients. As the first version of this questionnaire, the PCL was introduced in 1990. The PCL-5 is a revised version of the PCL in 2010 (10). The questionnaire consists of 20 items, wherein the answers are scored from 0 (not at all) to 4 (very serious), and the final score is normally between 0 and 100 (11). The PCL-5 was developed based on the PTSD diagnostic criteria in the DSM-5, and it includes four sub-scales that are typically consistent with the four symptoms of the disorder in the given manual. Examining the psychometric properties of the Persian version of the PCL-5 has also confirmed high internal consistency with a Cronbach's alpha coefficient equal to 0.92. The significant correlation between the scores on this scale with those of the Mississippi Scale for Combat-Related PTSD (MCCP) has further indicated the desirable convergent validity of 0.74. Favorable divergent validity has also been obtained by 0.46 compared to the Resilience Questionnaire scores (12). To determine the severity of the PTSD symptoms, different cutoff points have been thus far defined, ranging from 28 to 38. In this study, the cutoff point of 31 was taken into account (13).

3.4.2. Demographic Characteristics Questionnaire

In this study, a researcher-made questionnaire was used to obtain the demographic characteristics information, which included items focused on age, gender, level

of education, marital status, having children, and employment status.

3.5. Ethical Considerations

The initial proposal for this project was approved by the Ethics Committee of Mazandaran University of Medical Sciences, Sari, Iran, by the code of ethics: IR.MAZUMS.REC.1399.7671. We obtained the participants' satisfaction before asking about the checklist and the satisfaction of the hospital director.

3.6. Statistical Analysis

Data analysis was done using the SPSS software (ver.16). The data were also described via percentage, mean, standard deviation (SD), median, quartile, as well as minimum and maximum. Further comparisons of qualitative or categorical variables between the two study groups (viz. cases with and without PTSD) were fulfilled through the chi-square test or the Fisher's exact test. The quantitative variables between both groups were correspondingly compared using the independent-samples t-test or its non-parametric equivalent.

4. Results

In the present study, the frequency of the diagnosis of PTSD was investigated in the patients with COVID-19 in Sari, Iran. Accordingly, a total number of 199 patients with a history of hospitalization due to COVID-19 were included in this study (Table 1). Also, the overall prevalence rate of PTSD was 19.1% (38 patients). The prevalence rate of this condition in married cases was also higher than that in unmarried individuals, which was statistically significant based on Fisher's exact test results (19.1% of all patients [P-value = 0.005]). Regarding having children, 37 patients (18.6%) simultaneously affected with COVID-19 and PTSD had children as calculated by Pearson's chi-square test (P-value = 0.001).

Among different age groups, PTSD in the age group of 20 - 44 was observed in 38 patients (19.1%). Considering the level of education, the prevalence rate of PTSD was reported in nine patients (4.5%) with a high school diploma and 29 cases (14.6 %) with higher education (P-value < 0.001).

In respect of gender, the prevalence rate of PTSD in women was observed in 37 patients (18.6 %), and there was just one case (0.5%) in men, which was significant (P-value < 0.001).

Based on the patients' employment status, PTSD was found in 29 employed people (26.1%) as measured by the chi-square test (P-value = 0.005).

Moreover, 29 patients (14.6 %) with COVID-19 and PTSD were living in urban areas, and nine cases (4.5%) were residing in rural ones, but the difference between the two groups was not statistically significant (P-value = 0.370).

Also, 27 patients (13.6%) with COVID-19 and PTSD had no relatives working as HCWs during the pandemic. In 11 patients (5.5 %) simultaneously affected with these two disorders, their relatives were employed as HCWs; nonetheless, the difference between the two groups was not statistically significant (P-value = 0.371).

The infection with COVID-19 in relatives was also reported in 38 patients (19.1%) affected with COVID-19 and PTSD. The cases having no relatives with COVID-19 had not thus suffered from PTSD at the time of their infection with the pandemic (P-value < 0.001).

The death of someone as a relative due to COVID-19 was further observed in ten patients (5%) with PTSD. However, 28 patients (14.1%) with PTSD had not experienced the death of their relatives following COVID-19, and the difference between the two groups was not statistically significant (P-value = 0.603).

The comorbidity of psychiatric disorders in the patients with COVID-19 and PTSD was also reported in 38 cases (19.1%, P-value < 0.001); and in the end, the comorbidity of physical disorders in patients with COVID-19 and PTSD was found in 38 individuals (19.1%, P-value < 0.001).

5. Discussion

In this cross-sectional study, the overall prevalence rate of PTSD after being infected with COVID-19 was 19.1%, which was consistent with the results of similar surveys carried out by Forte et al. (29.5%) (11) and Poyraz et al. (34.5%) (12). The data from the previous pandemics have also revealed the prevalence rate of PTSD after COVID-19 by 32.2% (13). However, studies in China have reported lower prevalence rates (namely, 7% and 2.7%) due to the fulfillment of the investigations in the early months of the pandemic and the administration of non-specific questionnaires for PTSD diagnosis. In addition, the mentioned studies were merely recruited most of the patients among cases with acute stress disorder but not PTSD. Besides, there were differences in the statistical populations. Regarding the two Chinese studies, one was concerned with regions with a high frequency of patients, and the other one was related to university students quarantined at home due to COVID-19; hence, none of them examined hospitalized patients (14, 15).

With regard to gender, the prevalence rate of PTSD in the present study was much higher in women than in men, which was in line with the results of recent surveys on the prevalence rate of comorbid COVID-19 and PTSD (13,

Table 1. Relationship Between Demographic Variables and PTSD Frequency Following COVID-19 Outbreak [a]

Variables	With PTSD	Without PTSD	Significance Level P-Value
Gender			0.000
Male	1 (0.5)	105 (52.8)	
Female	37 (18.6)	56 (28.1)	
Age (y)			0.000
20 - 44	38 (19.1)	71 (35.5)	
45 - 64	0 (0.0)	49 (24.6)	
64 >	0 (0.0)	41 (20.6)	
Marital status			0.005
Married	38 (19.1)	136 (38.3)	
Single	0 (0.0)	25 (12.6)	
Level of education			0.005
Under high school diploma	0 (0.0)	57 (28.6)	
High school diploma	9 (4.5)	57 (28.6)	
Higher education	29 (14.6)	47 (23.6)	
Employment status			0.005
Employed	29 (14.6)	82 (41.2)	
Unemployed	9 (4.5)	79 (39.7)	
Having children			0.001
Yes	37 (18.6)	116 (58.3)	
No	1 (0.5)	45 (22.6)	
Place of living			0.370
Urban areas	29 (14.6)	133 (36.8)	
Rural areas	9 (4.5)	28 (14.1)	
Relatives working as HCWs			0.371
Yes	11 (5.5)	59 (29.6)	
No	27 (13.6)	102 (51.3)	
History of infection in relatives			0.000
Yes	38 (19.1)	107 (53.8)	
No	0 (0.0)	54 (27.1)	
History of death in relatives due to COVID-19			0.603
Yes	10 (5.0)	36 (18.1)	
No	28 (14.1)	125 (62.8)	
History of mental illnesses			0.000
Yes	38 (19.1)	27 (13.6)	
No	0 (0.0)	134 (67.3)	
History of physical disorders			0.000
Yes	38 (19.1)	85 (42.7)	
No	0 (0.0)	76 (38.2)	

[a] Values are expressed as No. (%).

16). It has been indicated that women also suffered more from the symptoms of recurrences, mood swings, cognitive changes, as well as arousal and reactivity based on the sub-symptom analysis. Previous studies on the pandemics in 2001 and 2009 similarly suggested that acute stress disorder and annoying memories were more common in women (13, 15, 17, 18).

In the present study, the prevalence rate of PTSD was higher in married people compared to unmarried cases. Additionally, a higher prevalence rate was seen in individuals with children, which agreed with other surveys on PTSD after being infected with COVID-19 (13).

In this study, infection with COVID-19 in one of the relatives was reported in 38 patients (19.1%) with COVID-19 and PTSD. The cases with no relatives with COVID-19 had not also suffered from PTSD at the time of their infection with the pandemic. These findings supported the results of previous studies on the SARS epidemic and showed that, in addition to life and health threats caused by the disease, inducing panic in society, infection in family members or friends could be experienced as a form of loss of social support, predisposing these individuals to PTSD (19). A similar study (2020) in northern Iran assessed the psychological effects of COVID-19 on quarantined individuals. In addition to the high prevalence of depression (22%), anxiety (14.5%), and stress (47.2%), the psychological effect of the pandemic had led to the possibility of probable or full PTSD (20).

Among the limitations of the present study was the small sample size. In addition, the cross-sectional nature of the study was one of the limitations due to the possibility of changing PTSD symptoms over time. Also, the study was conducted in the hospitals based in the city of Sari in northern Iran, and the generalization of the findings to other regions needed to be made with caution. Accordingly, longitudinal studies are recommended to reflect on PTSD symptoms more closely for its chronic course and prognosis following being infected with COVID-19. The similarity of the clinical pattern of psychiatric comorbidities in the SARS and COVID-19 epidemics also suggests that information regarding these crises will effectively handle problems and disorders until further evidence-based research is fulfilled.

5.1. Conclusions

This study showed that PTSD in patients with a history of COVID-19 had a high frequency, and it was important to assess it along with psychiatric evaluations conducted for these patients in the later stages of infection with COVID-19. Also, physicians should also treat the symptoms induced by this disorder in attendance.

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Footnotes

Authors' Contribution: Study concept and design: S.H.H; Acquisition of data: F.E and I.GH; Analysis and interpretation: M.M; Drafting of the manuscript: I.GH, F.E; Critical revision: F.E; Statistical analysis: M.M; Administrative, technical, and material support: S.H.H; Study supervision: S.H.H, F.E.

Conflict of Interests: The authors have no conflicts of interest relevant to this article.

Data Reproducibility: The data presented in this study are openly available in one of the repositories or will be available on request from the corresponding author by this journal representative at any time during submission or after publication. Otherwise, all consequences of possible withdrawal or future retraction will be with the corresponding author.

Ethical Approval: The initial proposal for this project was approved by the Ethics Committee of Mazandaran University of Medical Sciences, Sari, Iran, by the code of ethics: IR.MAZUMS.REC.1399.7671.

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Informed Consent: While collecting information, ethical considerations were observed, informed consent was obtained before filling out the questionnaire, and patients' information was recorded without mentioning their names.

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