Research Paper

Prevalence of Post-traumatic Stress Disorder in People With a History of Hospitalization With COVID-19 and Its Relationship With Socio-economic Status

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ABSTRACT

Background: COVID-19 has had many negative consequences in all aspects of human life, especially physical and mental health. This study aims to determine the prevalence of post-traumatic stress disorder (PTSD) in people with a history of hospitalization with COVID-19 and its relationship with socio-economic status (SES).

Materials and Methods: The present study was a cross-sectional descriptive study and the statistical population of the study included all people with a history of being infected with COVID-19 and subsequent hospitalization in Shohada Hospital of Sarpol-e Zahab, Kermanshah Province, Iran. The sample members were randomly selected from the list of hospitalized patients. A total of 479 people were evaluated face to face using the PTSD Checklist Scale (PCL-S) questionnaire to examine PTSD, as well as the Ghodrat Nama et al.'s SES questionnaire to determine the SES. The data were analyzed using SPSS software, version 21 and by Chi-square test, one-way ANOVA, and Pearson correlation coefficient ($P \leq 0.05$).

Results: The prevalence of PTSD was 31.10%. No significant relationship was observed between socioeconomic status and the prevalence of PTSD ($P=0.97$). Among the demographic variables, only gender had a significant relationship with the prevalence of this disorder ($P=0.00$) and the prevalence was higher in women than in men.

Conclusion: The prevalence of PTSD is high in people with a history of hospitalization with COVID-19. Getting infected with COVID-19 and subsequent hospitalization hurts people's mental health. Maintaining the mental health of this group of people should be considered.

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1. Introduction

COVID-19 was diagnosed in early December 2019 with symptoms of pneumonia in Wuhan City, the capital of Hubei Province in China [1]. This disease has spread rapidly in the world and has had severe economic, cultural, social, and psychological effects on people's lives and has caused an unprecedented crisis in the field of public health [2-4]. In addition to serious health problems, COVID-19 has caused many psychological problems among people [5]. Previous experiences with epidemics of infectious diseases have shown that the number of people who are psychologically affected by these epidemics is more than the number of physical sufferers of this disease, which indicates the widespread impact of such diseases on human mental health [6]. For example, Hugo et al. reported that Ebola survivors are at risk for posttraumatic stress disorder (PTSD) due to exposure to severe traumatic events associated with the disease and distressing thoughts about having a higher mortality rate [7]. Regarding the recent epidemic of COVID-19, Asmundson and Taylor, Taylor and Steven Taylor have shown that due to the very high rate of infection of COVID-19, severe cases, and relatively high mortality, many people are at risk of increasing PTSD, anxiety disorders, and depression [8-10]. Also, the reports of the United States center for disease control and prevention (CDC) about COVID-19 show that health anxiety, panic, adjustment disorders, depression, chronic stress, and insomnia are some of the psychological effects of this emerging disease [11]. This disease with its sudden and unexpected spread in societies and infecting countless people causes acute stress and fear reactions, the fear of this disease is very similar to the reactions observed after natural disasters. In addition to the mentioned cases, experiencing unfamiliar phenomena and sometimes observing critically ill patients in the hospital and unwanted quarantine in people who are admitted to the hospital due to illness are other factors that can affect the mental health of these people. Many of these patients may suffer from major depression, PTSD, and other mental disorders in the future [12]. This can be a vital issue regarding the mental health of these people. The results of research on previous infectious epidemics, such as the severe acute respiratory syndrome (SARS) in 2003 and the H1N1 flu in 2009, show that these diseases have caused significant panic in people and led to remarkable psychological problems [13, 14].

PTSD is a psychiatric disorder that involves severe distress and disruption in the patient's daily life that occurs due to exposure to a traumatic event. According to the diagnostic and statistical manual of mental disorders, 5th edition (DSM-5), stressful factors in this disorder include a severe threat to life, serious endangerment of physical health, great fear, helplessness, and panic [15]. Since COVID-19 threatens the integrity and physical health of people and causes a lot of fear in people, it has the characteristics of a traumatic event and can potentially lead to PTSD [16]. In previous serious infectious diseases, the prevalence of PSSD in the general population has been between 4% and 41% [17]. Research on the prevalence of previous strains of coronaviruses has shown that 25.6% of the survivors of SARS within 30 months of follow-up have estimated the criteria for PTSD [18]. PTSD symptoms can lead to drug abuse, depression, and sleep problems, all of which negatively affect people's communication, productivity, and daily life [19, 20].

Socio-economic status (SES) refers to the position or social class of a person or group compared to others, which is measured by their level of education, income, and occupation [21]. Among the determinants of health, SES is the most influential factor [22]. A review of the literature conducted by the World Health Organization (WHO) shows that 70% of the research on SES and health indicates a positive relationship between poverty and mental illness [23]. Given that poverty can be measured in terms of below-average SES, the results of this World Health Organization study are vital. Mental illness can be affected by environmental factors related to low economic and social status, such as unsafe living conditions [24]. SES affects the consequences of COVID-19. In the UK, people living in the most deprived areas are twice as exposed to COVID-19 as those living in more affluent areas. The death rate of COVID-19 in the most deprived areas was 1283 deaths per 100000 people, while in the prosperous areas, it was 588 deaths per 100000 people. It is essential to investigate the relationship between SES and the demographic characteristics of people with the psychological consequences of this emerging disease [25].

Understanding and explaining the effects of epidemics on people's psyches is necessary for their proper management. In an online survey conducted by Khalaf, Abdalgeleel, and Mostafa in 2022, titled "fear of COVID-19 infection and its relationship with symptoms of mental disorders", it has been shown that the participants who are most worried about COVID-19 and have had higher anxiety in this regard, have shown more negative psychological symptoms during the epidemic [26].

People who have experienced serious and critical conditions of COVID-19 and hospitalization, and their lives and health have been seriously threatened and experienced the risk of potential death, are considered one of the groups at risk for the occurrence of mental disorders during this epidemic. Anxiety caused by the symptoms and consequences of the severe and critical conditions of COVID-19 can be the basis of many psychological problems. Also, we have very little information about the impact of the COVID-19 disease on the spread or development of mental disorders, and the few research conducted due to the nature of the epidemic and the maintenance of social distancing has been conducted in the form of online surveys, which may have little accuracy due to sampling, method, and procedure and a research gap exists in this field. This study was conducted to determine the prevalence of PTSD in people with a history of COVID-19 and hospitalization and to investigate its relationship with SES. Also, the secondary goal of this research was to investigate the possible significant relationship between demographic variables, including gender, age, education level, marital status, and SES with PTSD.

2. Materials and Methods

This research is a descriptive-cross-sectional research and was conducted in Sarpol-e Zahab City located in Kermanshah Province in the west of Iran. The statistical population of this research was the patients with COVID-19 with a history of hospitalization in Shohada Hospital in this city. Since the beginning of the epidemic, Sarpol-e Zahab City has been facing a high prevalence of COVID-19 due to its location on one of the main routes of cargo and passenger transportation to Iraq and Iraqi travelers and infected non-natives from other parts of Iran. The sample size was calculated using the Cochran formula and was equal to 386 people. To make the results more accurate, as well as the possibility of non-participation of many samples due to the epidemic conditions at the time of the research, the final sample number was estimated to be 530 people, of which 479 people participated in the research.

The samples were randomly selected from the list of hospitalized patients using random number generation software. The inclusion criteria included having a history of COVID-19 and hospitalization, passing at least 6 months since discharge, not having a history of PTSD before COVID-19, informed consent about participating in the research, and awareness and appropriate alertness to answer the questions of the questionnaire. The exclusion criteria included unwillingness to cooperate in the research and incomplete completion of the questionnaires. The criterion for choosing a time interval of 6 months after discharge was the necessity of the presence and persistence of PTSD symptoms for at least 6 months for diagnosis based on the criteria of the diagnostic and statistical manual of mental disorders, 5th edition (DSM-5). After selecting the sample people and preparing the questionnaires, the sample members were invited to participate in the research through a phone call, and if they expressed their consent and agreement, the questionnaires were presented to them in person at the place announced by the people. To access the sample members, the first researcher went to different areas of Sarpol-e Zahab City and some nearby cities (Gilan-e Gharb, Qasr-e Shirin, Dalahu, and Salas-e Babajani) and provided the questionnaires to the people by being present at the sample members' place of residence. Initial oral consent was obtained when inviting the participants to participate in the research and the written consent of the patients to participate in this study was obtained when completing the questionnaires. In this research, the ethical considerations of the research include the participants' knowledge of the research objectives, voluntary participation, respect for privacy, confidentiality, and the right to withdraw from the research. The anonymity of the participants has been ensured in all stages of the research. All collected data were used only by the researchers. In the case of a limited number of sample members who were mostly illiterate due to their old age, the questions of the questionnaire were carefully read by the native researcher in the participants' mother tongue (Kurdish, Kalhori, and Sorani dialects) and the answers were recorded.

In this study, the PTSD checklist scale (PCL-S) questionnaire and the SES questionnaire of Ghodratnama et al. were used to collect data.

Posttraumatic stress disorder checklist scale (PCL-S)

The PCL-S is a self-report scale used as a diagnostic tool to assess PTSD symptoms and to screen these patients from the general population and other patients. This list was prepared by Weathers et al. based on DSM diagnostic criteria [27]. This questionnaire contains 17 items. The validity and reliability of the Persian version of this questionnaire in Iran have been shown by Varmaghani et al. The internal consistency of this scale was high and the Cronbach α was 0.92. Its convergent validity was equal to (0.74) and its divergent validity was equal to (0.46). This tool complies with the DSM-5 and can help professionals accurately diagnose PTSD [28].

Socio-economic status (SES) questionnaire

This questionnaire has 10 questions and examines the four components of income level, economic class, housing status, and education, and determines 5 socio-economic statuses, very low, low, medium, high, and very high. The validity of the questionnaire was done using factor analysis at Shahid Chamran University of Ahvaz City, Iran, and its validity was 0.752. In the initial studies, the reliability of the questionnaire was calculated using the Cronbach α equal to 0.72. The scoring of this questionnaire is on a 5-point Likert scale from 1 (very low) to 5 (very high) [29].

In this research, descriptive statistics, chi-square test, one-way analysis of variance (ANOVA), and Pearson's correlation method were used and the data were analyzed by SPSS software, version 21. P≤0.05 are considered statistically significant (P<0.05).

3. Results

The participants in this research included 255 (53.23%) men and 224(46.76%) women. In terms of age, 106 people (22.12%) were between 18-38 years old, 165 people (34.44%) were 38 to 58 years old, 163 people (34.02%) were 58 to 78 years old, and 45 people (39.39 9%) were over 78 years old. Regarding marital status, 148 people (30.89%) were single, 287 people (59.91%) were married, and 44 people (9.18%) were in the state of divorce or the death of their spouse. In terms of education, 34 people (07.09%) were illiterate, 95 people (19.83%) had a history of 5-8 years of education, 180 people (37.57%) had a diploma or associate degree, 122 people (46 25.00%) had a bachelor's degree, and 48 people (10.02%) had a master's degree or above. In terms of SES, 74 people (15.44%) were in very low SES, 178 people (37.16%) were in low SES, 149 people (31.10%) were in medium SES, 53 people (11.06%) were in high SES, and 25 people (21.05%) were in very high SES.

Based on the data analysis of the PCL-S questionnaire, 149 people (31.10%) had the necessary diagnostic criteria for PTSD and were suffering from PTSD. The point prevalence of PTSD in this study was 31.10%. Almost one in three recovered COVID-19 patients with a history of hospitalization had PTSD.

A significant relationship was observed between the gender variable and the prevalence of PTSD in recovered patients (Chi=17.78, P=0.00; P≤0.05). The prevalence of PTSD in women (40.62%) was higher than in men (22.74%). No significant relationship was observed between age and the prevalence of PTSD (Chi=2.97, P=0.39; P≤0.05).

In the case of the education variable, no significant relationship was found between the level of education and the prevalence of this disorder (Chi=0.51, P=0.97; P≤0.05). The relationship between marital status and the prevalence of PTSD was also not significant (Chi=4.82, P=0.08; P≤0.05) (Table 1).

The prevalence of the disorder in very low SES was 29.72%, in low SES 32.02%, in medium SES 30.20%, in high SES 30.18%, and in very high SES, 36.00%. No significant relationship was observed between SES and the prevalence of PTSD (Chi=0.49, P=0.97; P≤0.05). After conducting a one-way ANOVA to compare the average scores of PTSD in different SES, the F value was equal to 0.27, which shows no significant difference in SES (P≤0.84) (Table 2).

Also, Pearson's correlation coefficient was used to examine the relationship between the scores of the SES questionnaire and the scores of the PTSD questionnaire. Pearson's correlation coefficient was equal to 0.007, which shows no significant correlation between SES and PTSD (r [477]=0.00716, P=0.876).

4. Discussion

The results of this study showed that the prevalence of PTSD is high among patients who have recovered after being hospitalized with the diagnosis of COVID-19. Among the demographic variables, only the gender variable had a significant relationship with the prevalence of PTSD. The prevalence of this disorder in women was more and almost twice that of men. According to the research results of Flemingham et al. women react differently to stressful events compared to men and women experience more brain stem activation in response to threats. This means that women may show a stronger psychological reaction in this situation [30]. Others, such as Glover et al. and Lebron Milad et al. have justified the gender differences with hormones and state that the estrogen hormone, which is usually much less in men than in women, can be a crucial influencing factor in women's more intense responses to stressful events and more and more severe symptoms of PTSD [31, 32].

In this study, no significant relationship was observed between SES and PTSD, and the prevalence of PTSD was similarly high in all different SES. In explaining this result, it can be said that experiencing a serious and critical situation of COVID-19 and hospitalization is such a traumatic event that it can lead to PTSD in people with any SES.

Table 1. Prevalence of PTSD based on the demographic variables

Variables		No. (%)			Sig.	Chi-Square
		Sample	Cases With Diagnosis of Disorder	Cases Without Diagnosis of Disorder		
Gender	Man	255(53.23)	58(22.74)	197(77.25)	0.000*	17.78*
	Woman	224(46.76)	91(40.62)	133(59.37)		
Age (y)	18-38	106(22.12)	29 (27.35)	77(72.64)	0.39	2.97
	38-58	165(34.44)	48(29.09)	117(70.90)		
	58-78	163(34.02)	54(33.12)	109(66.87)		
	Above 78	45(9.39)	18(40.00)	27(60.00)		
Education status	Illiterate	34(7.09)	11(32.35)	23(67.64)	0.97	0.51
	5-8 years of education	95(19.83)	28(29.47)	67(70.52)		
	Diploma/associate degree	180(37.57)	54(30.00)	126(70.00)		
	Bachelor's degree	122(25.46)	40(32.78)	82(67.21)		
	Master's degree/higher	48(10.02)	40(32.78)	82(67.21)		
Marital status	Single	148(30.89)	42(28.37)	106(71.62)	0.08	4.82
	Married	287(59.91)	87(30.31)	200(69.68)		
	Divorce/death of a spouse	44(9.18)	20(45.45)	24(54.54)		
Socio-economic status	Very low	74(15.44)	22(29.72)	52(70.27)	0.97	0.49
	Low	178(37.10)	57(32.02)	121(67.97)		
	Medium	149(31.10)	45(30.20)	104(69.79)		
	High	53(11.06)	16(30.18)	37(69.81)		
	Very high	25(5.21)	9(36.00)	16(64.00)		
Sum		479(100)	149(31.10)	330(68.89)		

*Significant at P≤0.05

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In a study conducted by Alshehri et al. in Saudi Arabia on the prevalence of PTSD during the COVID-19 epidemic through online questionnaires, the prevalence of PTSD with three methods of cut-off scores, criteria, and combined were 22.63%, 24.8%, and 19.6%, respectively. Female participants showed a higher prevalence of this disorder [33]. The prevalence rate obtained in this study is lower than in the present study, but the higher prevalence of the disorder in women is consistent with the results of the present study. In another study conducted by Einvik et al. the prevalence and determinants of PTSD in hospitalized and non-hospitalized COVID-19 patients were investigated about 1.5 to 6 months after the onset of the disease. The research data were collected by mail and web-based methods and a total of 583 people were examined. The prevalence of PTSD was 9.5% in hospitalized patients and 0.7% in non-hospitalized patients [34]. The results of a systematic review and meta-analysis conducted by Zhang et al. also showed that the prevalence of PTSD during the COVID-19 epidemic in the general population was 15% [35]. The prevalence obtained in the two mentioned studies is lower than the result of the present study.

Table 2. One-way analysis of variance comparing average scores of disorder in different socio-economic statuses

Results	Sum Squares (SS)	d_f	Mean Squares (MS)	F	P
Between groups	409.88	4	102.47	<0.84	0.27
Intergroup	178827.48	474	377.27		
Sum	179237.37	478			

Health in Emergencies and Disasters Quarterly

In another meta-analysis conducted by Qiu et al. the prevalence of PTSD symptoms among people who were exposed to trauma due to the spread of COVID-19 was 28.34%. In this study, older age was associated with a higher prevalence of PTSD symptoms. This study showed that the prevalence of PTSD symptoms is very common among people who were exposed to a traumatic event caused by COVID-19 [36]. The rate of prevalence in this study is almost similar to the current study, but regarding the significant relationship between age and the prevalence of the disorder, this study is inconsistent with the results of recent studies.

In a study conducted by Yaru Chen et al. the prevalence of PTSD was 13.2%. In this research, hospitalized patients were more exposed to traumatic experiences [37]. In another systematic study and meta-analysis conducted by Salehi et al. to investigate the prevalence of PTSD during the COVID-19 epidemic, the prevalence of PTSD symptoms was about 18%. This meta-analysis showed that three out of ten coronavirus survivors, two out of ten healthcare workers, and one out of ten people in the general population experienced symptoms of PTSD during the COVID-19 epidemic [38]. In a cross-sectional survey conducted by Zhang et al. to investigate the prevalence and risk factors associated with psychiatric symptoms in patients with COVID-19 during the second wave of the epidemic in Beijing, the capital of China, in a sample of 119 people with COVID-19, the prevalence of PTSD symptoms was 33.6%. This study showed that the prevalence of PTSD symptoms among patients with COVID-19 in the second wave of the Beijing epidemic was high [39]. The result of this research is similar to the result of the current research.

Unlike most of the research on the prevalence of mental disorders during the COVID-19 pandemic, which was based on the web and people were surveyed online, and the random sampling method was rarely used, in this research, the random sampling method was used and collecting data and completing questionnaires have been used in person. Among the other strengths of this research, we can mention the novelty and freshness of the research area and the effort to increase our awareness about the psychological consequences of the emerging disease of COVID-19. Regarding the limitations of the research, it can be mentioned that some people may have refused to provide real answers. The unwillingness of many sample members to cooperate and the lack of research studies related to the prevalence of mental disorders in recovered COVID-19 patients to compare and explain the results have been other limitations of this research. The result of this research can be used for planning and supporting measures and mental health in society. To generalize the results, it is suggested that the current research is being carried out in other groups such as normal people or outpatients with COVID-19. It is also suggested that the organizations related to maintaining and promoting the mental health of society, plan and take necessary measures to prevent the creation or exacerbation of mental disorders and reduce the psychological consequences of this epidemic. People with a history of being infected with COVID-19 and being hospitalized, whose health and life are seriously threatened, can be one of the priority groups in this field.

5. Conclusion

This study showed that the prevalence of PTSD in people with a history of COVID-19 and hospitalization is high, and COVID-19 affects people's mental health. The prevalence of the disorder is similarly high in all social and economic situations, and in this respect, no significant difference is observed in different SES. Maintaining the mental health of this group of people should be considered.

Ethical Considerations

Compliance with ethical guidelines

The present research has been approved by the Ethics Committee of Kermanshah University of Medical Sciences (Code. IR.KUMS.REC.1400.214).

Initial oral consent was obtained when inviting the patients to participate in the research and the written consent of the patients to participate in this study was obtained when completing the questionnaires. In this research, the ethical considerations of the research included the participants' awareness of the research objectives, voluntary participation, respect for privacy, confidentiality, and the right to withdraw from the research in all stages of data collection. The anonymity of the participants has been ensured in all stages of the research. All collected data were used only by the researchers.

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Authors' contributions

Conceptualisation, study design and statistical analysis: Hafez Safari and Seyedabdolmajid Bahrainian; Data interpretation: Hafez Safari; Preparing the manuscript and final approval: All authors.

Conflict of interest

The authors declared no conflict of interest in this research.

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