Prevalence of Post-Traumatic Stress Disorder among Intensive Care Unit Survivors: A Prospective Study in Rasht, Iran

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Abstract

Background: Post-traumatic stress disorder (PTSD) is a psychological disorder resulting from a previous traumatic experience. The objective of the present study was to investigate the prevalence of PTSD and its related risk factors among Intensive Care Unit (ICU) survivors.

Methods: A total of 152 patients were followed up prospectively for one month. All included participants had Glasgow Coma Scale scores ranging from 12 to 15. PTSD was assessed using a Persian-translated version of the PTSD Checklist (PCL). Data were analyzed using SPSS 22.0 software.

Results: Among the participants, seventy-two (47.4%) men and eighty (52.6%) women with a mean age of 54.5 ± 19.19 years responded to the questionnaire. The prevalence of post-discharge PTSD was 87.5%. There was a significant correlation between PTSD mean score and clinical factors such as hospitalization reason, self and familial history of psychological disorders, and Richmond Agitation Sedation Score (RASS) ($p < 0.05$).

Conclusions: Our findings suggest that, despite often being ignored, post-discharge PTSD is a significant psychological issue for ICU survivors. This highlights the importance of supportive care plans for patients with a history of mental disorders and agitation. The involvement of psychotherapists is crucial to improving post-discharge quality of life.

Keywords: Post-Traumatic Stress Disorder; Intensive Care Unit; Trauma; ICU Survivors

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Introduction

Post-traumatic stress disorder (PTSD) is a psychological condition caused by a combination of physical, mental, behavioral, and cognitive disorders resulting from previous emotional trauma. It is mainly characterized by repetitive intrusive thoughts, nightmares, flashbacks of past traumatic events, avoidance of reminders of the incident, hypervigilance, and sleep disturbances, which significantly affect patients' physical, mental, and social health [1-3]. In the United States, it has been reported that annually, $44 billion are spent on PTSD treatment [1]. If left untreated, PTSD symptoms can pose serious health risks, particularly in cases involving cardiovascular events and cancer [3].

The Intensive Care Unit (ICU) is an extremely stressful environment in hospitals and care centers, exposing patients to a variety of stress-inducing factors such as the continuous sounds of pulse oximeters and ventilator signals [4]. Most patients hospitalized in the ICU are unconscious, while others, such as those with minor cerebral ischemia and trauma-induced injuries, are conscious and subsequently experience several unpleasant situations. These include separation from family, contact with unfamiliar healthcare workers, and undergoing stressful procedures like dressing changes, all of which can result in mental trauma and eventually PTSD [5, 6]. Additionally, some patients experience delirium and hallucinations, which can

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double their stress and fear [7, 8]. Furthermore, conscious survivors may witness other patients undergoing frightening procedures and conditions such as severe bleeding and invasive surgical interventions [4].

The prevalence of PTSD in ICU survivors varies widely among different studies [9-12]. According to one study, the prevalence of post-discharge PTSD after three months in ICU survivors ranged from 3.2% to 14.8% [11]. All the aforementioned studies concluded that ICU survivors are at high risk of developing post-charge PTSD [10, 13]. Therefore, it can be concluded that hospitalization in the ICU can independently lead to PTSD in survivors [14, 15]. Epidemiological studies on ICU survivors have reported controversial findings regarding the population-based prevalence of PTSD [9, 11, 14], which may be influenced by various factors such as population demographics, technical methods, and geographical differences.

The prevalence of PTSD in ICU survivors in Iran might be much higher due to lower rates of psychological support and hospitalization technologies. Also, patients with post-discharge PTSD were mostly associated with poorer quality of life compared to other survivors in different aspects such as interpersonal relationships, sexual function, and physical activities [16, 17]. Therefore, it is crucial to identify PTSD risk factors to improve the post-discharge quality of life in ICU survivors. The aim of the present study was to estimate the prevalence of post-discharge PTSD in ICU wards of secondary care centers in Rasht, Iran, and its risk factors.

Material and Methods

In this descriptive cohort study, patients hospitalized in the Intensive Care Unit wards of Poursina Hospital, a secondary care center in Rasht, Iran, from April to June 2021 were included. The patients were from different ICUs, including general, coronary care, and postcardiac care units, using a convenience sampling method. The inclusion criteria were as follows: a history of being hospitalized in the mentioned wards for at least one month, conscious patients (12-15 score range in Glasgow Coma Scale), willingness to participate in the study, being available, and being able to respond to the questionnaire. Patients with mental disorders and those who expired during follow-up were excluded from the study. The sample size was calculated using G*Power software (ver 9.3.3) and parameters according to previous studies (33% prevalence of PTSD, $\alpha = 0.05$, $\beta = 0.8$, and 0.05 estimated error) [18] as 145 participants. However, 160 patients were sampled using the convenience sampling method to compensate for a 20% attrition rate.

A pre-administered checklist was used to collect information. Demographic information such as gender, age, marital status, education status, self and familial history of psychological disorders, familial history of hospitalization in the neurology ward, hospitalization duration, hospitalization reason, and telephone number were extracted from the patients' medical records. Patients' agitation status was evaluated according to the Richmond Agitation Sedation Score (RASS), which were classified as sedative (-5 to -1), alert (-1 to 1), and combative (1 to 5) [19].

The PTSD Checklist (PCL) (Persian Version) was used for PTSD determination. The questionnaire was self-administered by patients, and for illiterate cases, it was conducted through interviews after one month of follow-up. Follow-up was conducted during routine medical checkups or home visits. All home interviews were conducted following phone contact and obtaining verbal consent. The validity of the Persian-translated version of the PCL questionnaire was investigated and approved by Goodarzi et al. [20]. Additionally, the reliability of the mentioned questionnaire has been investigated by Sadat et al. [21], with a Cronbach's alpha coefficient of 0.87 [21]. This questionnaire consists of 17 items in three domains. In the first domain, patients' perceptions of experiencing a traumatic event are evaluated in 5 items. In the second domain, mental and emotional numbness are evaluated in 7 items, and in the third domain, the symptoms of arousal reactions to triggers are investigated in 5 items. All items are responded to according to a five-point Likert scale from 1 to 5. The total score range is from 17 to 85, and a score of 43 has been chosen as a threshold for determining PTSD development [22].

All patients were instructed before participating in the study. Participants were free to exit the study at any time they wanted. Additionally, verbal consent was obtained from participants before conducting home visits. The study protocol was reviewed and approved by the Guilan University of Medical Sciences ethical board (IR.GUMS.REC.1400.100). The study protocol was also conducted according to the declarations of Helsinki.

Data were analyzed using SPSS 22.0 (IBM, IL, Chicago, USA). Descriptive data were reported as mean ± standard deviation. The distribution normality hypothesis of the PCL questionnaire was analyzed and accepted using the Kolmogorov-Smirnov test (Statistics = 0.163, p = 0.185). Thus, intergroup analysis was conducted using the Student's t-test for bivariate variables and One-way ANOVA with Tukey post-hoc for multivariate variables. Correlation between age and mean PCL score was analyzed using

the Pearson correlation test. A p-value < 0.05 was considered statistically significant.

Results

Out of 152 patients, 72 (47.4%) men and 80 (52.6%) women with a mean age of 54.5 ± 19.19 years were included in the study. Demographic information is illustrated in Table 1. A total of 114 (75%) patients had a PCL score of > 43, indicating the development of PTSD. The mean PCL score for all participants was 58.38 ± 15.59.

One-way ANOVA and Tukey post-hoc tests, along with the Student's t-test, were used to compare mean PCL scores according to different demographic and clinical characteristics in participants. Data are illustrated in Table 2. Furthermore, the Pearson correlation test was conducted to investigate the correlation between participants' age and PCL score. Our findings suggested that there was an inverse correlation (r = -0.108) between age and mean PCL, although this correlation was not statistically significant (p = 0.187).

For categorized parameters, our findings suggested that the mean PCL score was significantly higher in patients with both self (p = 0.04) and familial (p = 0.02) history of psychological disorders. Additionally, the mean PCL score was significantly higher in patients hospitalized due to stroke compared to patients hospitalized due to post-surgery considerations (p = 0.04). Furthermore, the mean PCL score was significantly higher in alert patients compared to sedated patients (p = 0.03).

Our findings suggested that there was no significant association between PCL score and participants' gender (p = 0.31), history of substance abuse (p = 0.65), history of hospitalization in the neurology ward (p = 0.69), hospitalization duration (p = 0.16), educational level (p = 0.42), and marital status (p = 0.18).

Discussion

Our findings suggested that 75 percent of ICU survivors had experienced post-discharge PTSD. In addition, some clinical factors, such as self and family history of psychological disorders, as well as agitation status, were related to PTSD. In their study in Kashan, Sadat estimated post-discharge PTSD at 48% [21]. In another study on the Danish population, Ratzen et al. reported post-discharge PTSD at 19.2% [23]. The prevalence of post-discharge PTSD was reported to range from 16 to 33 percent in previous studies [24-27]. Additionally, our findings suggested that PTSD severity was not correlated with a history of substance abuse, whereas Sadat et al. suggested that a history of substance abuse increased the risk of PTSD [21]. The differences in findings may be due to variations in study instruments, sample sizes, underlying diseases, ICU stay duration, and follow-

Table 1. Descriptive findings of study factors

Variable		Frequency	Percent
Age	17 to 30 years	15	9.9
	31 to 45 years	42	27.6
	46 and older	95	62.5
Gender	Men	72	47.4
	Women	80	52.6
Familial History of psychological disorders	Yes	30	19.7
	No	122	80.3
Familial History of hospitalization in Neurology ward	Yes	8	5.3
	No	144	94.7
History of Psychologic Disorders	Yes	25	16.4
	No	127	83.6
Hospitalization Reason	Trauma	60	39.5
	Stroke	41	27
	Post-surgery	51	33.7
Hospitalization Duration	Less than 3 days	70	46.1
	4 to 7 days	52	34.2
	More than 1 week	30	19.7
Education level	Academic	83	54.6
	Non-academic	69	45.4
History of substance abuse	Yes	30	9.7
	No	122	80.3
RASS Score	Sedated	28	18.4
	Alert	3	2
	Combative	121	79.6
Marital Status	Unmarried	9	5.9
	Married	143	94.1

Table 2. Comparison between demographic and clinical characteristics with mean PCL scores using Univariate analysis

Parameter		Mean	STD	T / F	p-value
Gender [1]	Men	57.03	15.81	- 1.011	0.31
	Women	59.54	15.39		
History of Substance Abuse [1]	Yes	59.53	16.39	0.435	0.65
	No	58.09	15.44		
Familial History of Psychological Disorders [1]	Yes	59.47	15.98	-2.35	0.02 *
	No	52.83	15.21		
Familial History of Hospitalization in Neurology ward [1]	Yes	60.5	20.15	0.395	0.69
	No	58.26	15.83		
History of Psychological disease [1]	Yes	60.56	15.03	1.765	0.04*
	No	57.94	15.72		
Hospitalization duration (days) [2]	Less than 3	58.59	15.49	1.8	0.16
	4 to 7	60.27	14.87		
	More than 8	53.70	16.61		
Hospitalization Reason [2]	Trauma	57.10	16.36	2.83	0.04 *
	Stroke	64.83 *	15.38		
	Post-surgery	51.10 *	13.79		
Education Status [1]	Yes	59.30	15.74	0.802	0.42
	No	57.36	15.45		
Marital Status [1]	Unmarried	65.11	11.76	1.34	0.18
	Married	57.95	15.74		
Agitation Status [2]	Sedated	63.96 *	27.80	2.96	0.03*
	Alert	51.33 *	6.80		
	Combated	57.26	13.35		

1. Student t-test, 2. One Way ANOVA

up periods. Furthermore, PCL questionnaire cut-offs vary from 35 to 50 in different studies, so diagnostic criteria in previous studies were different.

Our study suggested that PTSD severity was higher in patients with self and familial history of psychological disorders. It seems that a history of mental and psychological comorbidities led to more invasive medical interventions and subsequently more post-discharge PTSD. Previous studies suggested that delirium could be an independent predictive factor of post-discharge PTSD among ICU survivors [29, 33]. Despite its high importance, psychological disorders such as delirium and bipolar disorders remain ignored in clinical fields, leading to unpleasant outcomes for both patients and the healthcare team.

Our findings did not find any correlation between patients' age. This finding was in agreement with previous studies [18, 28], while Sadat et al. [21] suggested that PTSD severity was higher in older patients.

Additionally, our findings suggested no association between survivors' gender and PTSD severity, which was in accordance with previous studies [18, 21, 29]. However, other studies suggested that the risk of PTSD among ICU survivors was doubled for females compared to males [23, 30, 31, 32].

Furthermore, our findings suggested that the prevalence of post-discharge PTSD was not associated with marital status. Contrary to our findings, Sadat et al. suggested that the prevalence of PTSD was higher in unmarried patients [21, 33, 34]. The differences in findings may be due to variations in sample size and tools.

PTSD is a common comorbidity among ICU survivors, even after two years [35]. Therefore, it is highly suggested to emphasize its importance on post-discharge quality of life.

Conclusion

According to our findings, the prevalence of post-discharge PTSD among ICU survivors is significant. Clinical factors like past medical history and agitation severity affect post-discharge PTSD occurrence during ICU hospitalization. Therefore, efforts should be made to identify and emotionally support agitated patients and patients with a history of psychological disorders to reduce the risk of post-discharge PTSD in the long term.

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