

# The relationship between post-traumatic stress disorder and sleep quality in intensive care unit professionals

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## Abstract

**Background:** Intensive care units (ICUs) have impact on physical and mental health not only for patients but also for health professionals. Post-traumatic stress disorder that may occur in ICU professionals may negatively affect the treatment and care process by affecting their sleep quality.

**Aim:** This study aims to evaluate the relationship between post-traumatic stress disorder and sleep quality in intensive care unit professionals.

**Study Design:** The cross-sectional study conducted with 341 (nurses, physicians and others) professionals working in the ICUs in Turkey. Data were collected with a socio-demographic form, Posttraumatic Stress Disorder-Short Scale (PTSD-SS) and Richard-Campbell Sleep Questionnaire (RCSQ).

**Results:** The mean PTSD-SS and RCSQ scale scores of the participants were  $15.37 \pm 6.72$  (min: 0, max: 35) and  $46.61 \pm 22.46$  (min: 0, max: 100). When the cutoff points of the scores obtained from PTSD-SS was examined, 12.9% ( $n = 33$ ) of ICU nurses, 11.3% ( $n = 6$ ) of the physicians and 3.4% ( $n = 1$ ) of the other health professionals had post-traumatic stress disorder symptoms, and it was determined that the prevalence of PTSD in all ICU professionals was 12% ( $n = 40$ ). In addition, there was a statistically significant negative weak correlation between PTSD-SS and RCSQ ( $r = -0.207$ ) ( $p < .05$ ).

**Conclusions:** The results of this study show that increasing the level of PTSD causes sleep quality to deteriorate. Therefore, evaluation and recognition of PTSD symptoms in ICU professionals and interventions to be important in maintaining sleep quality. Additionally, the results of this study can be used in planning to improve the mental health of ICU nurses. Therefore, greater support for ICU nurses to prevent PTSD is recommended.

**Relevance to Clinical Practice:** It is important and necessary to prevent the development of PTSD in ICU nurses and to reduce its negative impact on sleep quality.

## KEYWORDS

anxiety, intensive care, post-traumatic stress disorder, sleep quality

## 1 | INTRODUCTION AND BACKGROUND

Intensive care unit (ICU) health professionals, especially nurses and physicians, play an important role in the changes of general condition and consciousness levels of the patients, in the direction of treatment and in making decisions about the patient followed in ICUs.<sup>1</sup> Sudden changes in the patient's condition bring about rapid decision-making and treatment and care interventions by them. It also is inevitable that the stress level of ICU professionals is high because of reasons such as cardiopulmonary resuscitation, intubation, difficulty in care, excessive workload, death, reactions of patient relatives, infections, indoor environment, isolation, noise, artificial light, humidity and temperature, and difficulty in decision-making. This may cause stress and anxiety disorders in intensive care unit professionals.<sup>2</sup> Asl et al. reported that work stress is high in ICU nurses, they experience more stress than others because of their high skill level, the necessity of quick response to emergency situations and the heavy responsibility of caring for patients, and as a result, this stress increases physical and psychiatric disorders.<sup>3</sup> Being exposed to these for most of life can have a traumatic effect on ICU professionals, and this may increase the prevalence of post-traumatic stress disorder (PTSD).

PTSD occurs with symptoms such as repetitive, involuntary and compulsive distressing memories of the traumatic situation, prolonged psychological distress in exposure and continuous experience of traumatic situations.<sup>4</sup> Li et al. examined depression, anxiety and PTSD in health professionals during the Covid-19 period in 65 studies and determined PTSD in approximately one-fifth of health professionals.<sup>5</sup> Zhang et al. reported anxiety symptoms in approximately half of the nurses and physicians working in the ICUs.<sup>6</sup> Baysak et al. stated that the rate of PTSD in ICU professionals is 15% and that medical intervention is to be given to a child or a young person at the time of death cause PTSD in health workers.<sup>7</sup> In a study conducted with 175 neonatal ICU nurses, it was stated that 49% of the nurses had moderate and severe PTSD.<sup>4</sup> In another study conducted with ICU professionals in Singapore, it was found that 33% of the workers had significant post-traumatic stress symptoms.<sup>8</sup> It has been reported that a person's PTSD symptom severity is closely related to occupational stress factors, which include a high frequency of encountering sudden changes and difficult situations in addition to individual risk factors.<sup>9</sup> As a result, it can be predicted that when PTSD develops in ICU professionals, it may cause lower sleep quality.<sup>10</sup>

Sleep is a routine that is necessary for the protection of physical and mental health and for the organism to carry out its vital activities.<sup>11</sup> In addition to the duration of sleep, the quality of sleep is also important for positive health. Health professionals usually work in shifts. Therefore, ICU professionals must cope with sleep problems and the problems caused by it.<sup>12</sup> AbuRuz and Hayeah reported that the levels of insomnia, depression, anxiety and fatigue are high in nurses working night shift in the ICUs.<sup>13</sup> Stoyanova et al. determined that cortisol levels of intensive care nurses were higher than ward nurses, and insomnia and fatigue were higher, especially in night shift workers.<sup>14</sup> Zhang et al. reported anxiety symptoms in approximately half of the nurses and physicians working in the ICUs.<sup>6</sup> As a result, when anxiety occurs, they may experience physical symptoms such as sleep problems, stress, fatigue, muscle spasms, tachycardia, a feeling of distress and a sense of squeezing.<sup>15</sup> In

### What is known about the topic

- Working in the ICU is a risk factor for developing PTSD in health professionals.
- PTSD developing in ICU professionals has some physical and psychological consequences.

### What this paper adds

- ICU nurses are at greater risk for PTSD than other health professionals.
- A negative weak correlation was determined between PTSD and sleep quality in ICU professionals.
- It is useful to make plans to evaluate ICU nurses and other health professionals for PTSD.

a study conducted in Norway, it was reported that ICU workers were at risk for anxiety and PTSD.<sup>16</sup> Therefore, determining both PTSD severity and sleep quality in intensive care unit workers and determining the effect of PTSD severity on their sleep quality may enable the necessary interventions and support systems to be activated.

## 2 | AIM

This study was aimed to evaluate the relationship between PTSD and sleep quality and to examine the affecting factors.

## 3 | DESIGN AND METHODS

### 3.1 | Setting and sample

The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist was followed in reporting this study. This cross-sectional study was conducted with 341 health professionals working in ICUs in Turkey between May and September 2022. The sample of the study was calculated with a 95% confidence interval (CI) and 80% power by considering the mean and standard deviation values ( $32.71 \pm 9.05$ ) obtained from the Turkish validity and reliability study of the PTSD scale.<sup>17</sup> According to this calculation, the sample size was determined as 220 ICU professionals.

$$N = \frac{\sigma^2 (z_{1-\beta} + z_{1-\alpha/2})^2}{(\mu_0 - \mu_1)^2}$$

$$N = \frac{(9.05^2 (0.84 + 1.96)^2)}{(32.71 - 31)^2}$$

$$N = 220$$

The inclusion criteria for the study were working in ICUs for at least a year and volunteering to participate in the study. No sampling

method was used in the study. All ICU professionals who met the inclusion criteria were invited to the study, and the study was conducted with volunteers. Data were collected via Google Forms. The participants were informed about the purpose of the study before starting the form in Google Forms. Participants completed the survey in 15–20 min. First, each author sent the research link to at least one ICU professional via WhatsApp. At the same time, each participant was asked to share the link with the ICU professionals they knew and worked with. Thus, the study participation link was extended to ICU professionals. After 341 participants, at least 1 month was waited and the study was terminated.

### 3.2 | Questionnaires

The data collection form includes a sociodemographic form, Posttraumatic Stress Disorder (PTSD)-Short Scale and Richard-Campbell Sleep Questionnaire (RCSQ).

**Sociodemographic form:** This form contains sociodemographic characteristics such as gender, profession, education level, marital status, having children, having head/neck/nape/waist pain, age and professional and ICU experiences time.

**Posttraumatic Stress Disorder (PTSD)-Short Scale:** It was developed by LeBeau et al. in 2014 to determine how disturbed individuals are about the situation that occurs or worsens after an extremely severe event or experience.<sup>18</sup> The Turkish validity and reliability of the scale were performed by Evren et al.<sup>17</sup> It consists of nine items and a 5-point Likert type (not at all = 0, extremely = 4). The lowest and highest scores that can be obtained from the scale are 0 and 36. In the Turkish version of the scale, the cutoff point for PTSD is specified as 24. In this study, Cronbach's alpha value was determined as .849.

**Richard-Campbell Sleep Questionnaire (RCSQ):** The scale, developed by Richards in 1987, is a 6-item scale that evaluates the depth of night sleep, the time to fall asleep, the frequency of waking, the time to stay awake when awakened, the quality of sleep and the noise level in the environment.<sup>19</sup> The Turkish validity and reliability of the scale were performed by Karaman Özlü and Özer in 2015.<sup>20</sup> Each item in the scale is evaluated on the chart between 0 and 100 with the visual analogue scale technique. A score of "0–25" on the scale indicates very bad sleep, and a score of "76–100" indicates very good sleep. The total score is evaluated over five items, and the sixth item, which evaluates the noise level in the environment, is excluded from the total score evaluation. As the score increases, the sleep quality of the individual also increases. In this study, Cronbach's alpha value was determined as .789.

### 3.3 | Data analysis

The data obtained from the research were analysed with SPSS 21.0 (IBM Corp., Armonk, NY, USA) program. In the evaluation of the data, numbers and percentages were used for categorical variables. For continuous variables, mean, standard deviation, minimum and maximum were used for normally distribution and median, first and third

**TABLE 1** Socio-demographic characteristics of ICU health professionals.

Variables		n	%
Gender	Female	232	68.0
	Male	109	32.0
Profession	Physician	54	15.8
	Nurse	258	75.7
	Other workers	29	8.5
Education	High school	52	15.2
	Associate	50	14.7
	Graduate	163	47.8
	Master	46	13.5
	PhD	30	8.8
Marital status	Married	149	43.7
	Single	192	56.3
Having children	Yes	114	33.4
	No	227	66.6
Head, neck, nape and waist pain	Yes	316	92.7
	No	25	7.3
	Median	First quartile	Third quartile
Age	27.00	24.0	35.0
Professional experience	6.00	2.0	12.0
Intensive care experience	3.00	2.0	7.0

Abbreviation: ICU, intensive care unit.

quartiles for not normally distribution. The conformity of continuous variables to normal distribution was evaluated by the Kolmogorov-Smirnov test. The Mann-Whitney *U* test was used for comparisons of continuous variables between two groups, and the one-way analysis of variance test was used for comparisons between multiple groups.  $p < .05$  was accepted as the statistical significance. The power of the correlation coefficient was indicated by *r*.

## 4 | ETHICAL CONSIDERATIONS

Ethics committee approval was obtained from the Sağlık Bilimleri University Hamidiye Scientific Research Ethics Committee (Date:13.05.2022/ no:13/27). In addition, the participants were informed about the study, and their consent was obtained in a digital environment at the beginning of the survey. All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000.

## 5 | RESULTS

Personal characteristics of ICU professionals are given in Table 1. 75.7% ( $n = 258$ ) of the participants were nurses, 68% ( $n = 232$ ) were

**TABLE 2** Comparison of the mean scores for the scales according to descriptive characteristics of ICU health professionals.

		Posttraumatic stress disorder-short scale		Richard-Campbell sleep questionnaire	
		$\bar{X} \pm SD$	$F$ $p$ Post hoc	$\bar{X} \pm SD$	$F$ $p$ Post hoc
Profession	Physician (a)	14.05 $\pm$ 6.86	5.176	57.50 $\pm$ 19.64	4.508
	Nurse (b)	15.98 $\pm$ 6.74	.006*	47.82 $\pm$ 22.61	.012*
	Other workers (c)	12.34 $\pm$ 5.04	$b > c$ RR: 0.917, 95% CI, 0.771–1.090	46.30 $\pm$ 23.26	$a > b$ RR: 0.214, 95% CI, 0.054–0.851
Education	High school (a)	15.56 $\pm$ 7.32	5.753	43.71 $\pm$ 28.22	2.582
	Associate (b)	16.08 $\pm$ 6.18	.218	48.06 $\pm$ 23.43	.037*
	Graduate (c)	15.77 $\pm$ 6.68		48.27 $\pm$ 20.48	$d > a$ RR: 0.678, 95% CI, 0.281–1.634
	Master (d)	13.33 $\pm$ 6.62		56.16 $\pm$ 22.14	
	PhD (e)	14.80 $\pm$ 6.68		55.29 $\pm$ 17.39	
		$\bar{X} \pm SD$	$Z_{MWU}$ $p$	$\bar{X} \pm SD$	$Z_{MWU}$ $p$
Gender	Female	16.33 $\pm$ 6.60	–3.959	49.21 $\pm$ 22.60	–0.113
	Male	13.32 $\pm$ 6.52	.000* RR: 0.849, 95% CI, 0.699–1.030	49.25 $\pm$ 22.26	.910
Marital status	Married	14.49 $\pm$ 6.62	–2.307	52.97 $\pm$ 22.79	–2.899
	Single	16.05 $\pm$ 6.73	.021* RR: 0.787, 95% CI, 0.615–1.008	46.32 $\pm$ 21.83	.004* RR: 0.862, 95% CI, 0.597–1.244
Pain	Yes	15.81 $\pm$ 6.42	–4.329	48.05 $\pm$ 22.10	–3.363
	No	9.80 $\pm$ 7.99	.000* RR: 1.021, 95% CI, 0.913–1.143	64.08 $\pm$ 21.96	.001* RR: 1.070, 95% CI, 1.016–1.126
		$r$	$p$	$r$	$p$
Age		–0.144	.008*	0.138	.011*
Professional experience		–0.122	.025*	0.111	.040*

Note: Spearman correlation: \* indicates statistical significance. \* $p < 0.05$ ;  $F$ : one-way ANOVA;  $Z_{MWU}$ : Mann Whitney  $U$  test.

Abbreviations: ANOVA, analysis of variance; CI, confidence interval; ICU, intensive care unit; RR, relative risk; SD, standard deviation.

females, and the median age was 27.00 years. The median professional experience and intensive care experience of participants were 6.00 and 3.00 years, respectively.

The mean PTSD-SS and RCSQ scores according to the characteristics of participants and those found to be statistically significant were shown in Table 2. A statistically significant difference was found between the mean scores of the participants according to their profession in the PTSD-SS ( $F = 5.176$ ,  $p = .006$ ) and RCSQ ( $F = 4.508$ ,  $p = .012$ ). While nurses had higher PTSD severity from other workers (relative risk [RR]: 0.917, 95% CI, 0.771–1.090), physicians had higher sleep quality from nurses (RR: 0.214, 95% CI, 0.054–0.851).

A statistically significant difference was found between the mean scores of the participants according to education levels for the RCSQ ( $F = 2.582$ ;  $p = .037$ ) (Table 2). Sleep quality was determined to be higher in master's graduate participants from high school participants (RR: 0.678, 95% CI, 0.281–1.634).

In this study, a statistically significant difference was found between the mean scores of the nurses according to gender for the PTSD-SS ( $Z = -3.959$ ;  $p = .000$ ), and the mean scores of the women participants were higher (RR: 0.849, 95% CI, 0.699–1.030).

A statistically significant difference was found between the mean scores of the participants according to marital status ( $Z = -2.307$ ;  $p = .021$ ) and body pain ( $Z = -4.329$ ;  $p = .000$ ) for the PTSD-SS. While single participants experience more severe PTSD (RR: 0.787, 95% CI, 0.615–1.008), the severity of stress disorder is higher in those who experience pain (RR: 1.021, 95% CI, 0.913–1.143). Additionally, married people have higher sleep quality from single ( $Z = -2.899$ ;  $p = .004$ ) (RR: 0.862, 95% CI, 0.597–1.244), and sleep quality was lower in participants with body pain ( $Z = -3.363$ ;  $p = .001$ ) (RR: 1.070, 95% CI, 1.016–1.126) (Table 2).

There was a statistically significant negative weak correlation between the age of the participants and PTSD-SS ( $r = -0.144$ ) ( $p < .05$ ), and a statistically significant positive weak correlation between RCSQ ( $r = 0.138$ ) ( $p < .05$ ). It was determined that there was a statistically significant negative weak correlation between professional experience and PTSD-SS ( $r = -0.122$ ) ( $p < .05$ ) and a statistically significant positive weak correlation between RCSQ ( $r = 0.111$ ) ( $p < .05$ ) (Table 2).

The mean PTSD-SS and RCSQ scale scores of the participants were  $15.37 \pm 6.72$  (min: 0, max: 35) and  $46.61 \pm 22.46$  (min: 0, max: 100) (Table 3). When the cutoff points (cutoff points: 24, range 0–35)

**TABLE 3** The mean scores of the scales.

Scales	$\bar{X} \pm SD$	Min	Max
PTSD-SS	15.37 $\pm$ 6.72	0	35
RCSQ	46.61 $\pm$ 22.46	0	100
Cutoff point >24			
		n	%
Nurses		33 (N = 258)	12.9
Physicians		6 (N = 54)	11.3
Other health professionals		1 (N = 29)	3.4

Abbreviations: PTSD-SS, Posttraumatic Stress Disorder-Short Scale; RCSQ, Richard–Campbell Sleep Questionnaire; SD, standard deviation.

**TABLE 4** Correlations among scales.

Scales	r	p
PTSD-SS	$r = -0.207$	$p = .000^*$
RCSQ		

Abbreviations: PTSD-SS, Posttraumatic Stress Disorder-Short Scale; RCSQ, Richard–Campbell Sleep Questionnaire.

\*Spearman correlation,  $p < .001$ .

**TABLE 5** Regression analysis.

Independent variables	Richard–Campbell Sleep Questionnaire (B)				
	B	SE	Beta	t	p
Constant	60.064	2.976		20.184	.000*
Posttraumatic Stress Disorder-Short Scale (A)	−0.705	0.177	−0.211	−3.974	.000*

R: 0.211;  $R^2$ : 0.672; Adj $R^2$ : 0.045; F: 15.795;  $p = .000$ ; Durbin–Watson: 2.079

\* $p < .001$ .

of the scores obtained from PTSD scale was examined, 12.9% ( $n = 33$ ) of ICU nurses, 11.3% ( $n = 6$ ) of the physicians and 3.4% ( $n = 1$ ) of the other health professionals had PTSD, and it was determined that the prevalence of PTSD symptoms in all intensive care unit professionals was 12% ( $n = 40$ ).

When the correlations between the scales were examined, there was a statistically significant negative weak correlation between PTSD-SS and RCSQ ( $r = -0.207$ ) ( $p < .05$ ) (Table 4). According to the regression model, the PTSD explains 4.5% ( $p < .05$ ) of sleep quality. Sleep quality score was negatively affected by PTSD severe level ( $\beta = -.211$ ) (Table 5).

## 6 | DISCUSSION

This study was designed to evaluate the relationship between PTSD and sleep quality levels in ICU professionals. When the PTSD-SS and

RCSQ scale scores of ICU professionals were examined, it is seen that they are at a moderate level and the prevalence of PTSD in all of them was determined as 12%. When the relationship between the ICU professionals and the scales was examined, it was determined that the PTSD severe level of the nurses were statistically significantly higher than the others and their sleep quality decreased ( $p < .05$ ). Hamed et al. reported that approximately 20% of nurses have PTSD symptoms and that the prevalence of these symptoms is higher in nurses working in ICUs.<sup>21</sup> Greenberg et al., in their study with 709 ICU professionals, reported that 40% of the professionals had PTSD symptoms. In addition, they determined that in the case of mental disorders such as PTSD, depression and anxiety in ICU professionals, self-harming thoughts, alcohol use, and wanting to die are desired.<sup>22</sup>

It was determined that the sleep quality of master's and doctoral graduates was better than the other educational levels ( $p < .05$ ). Rahman and Don stated that as the educational levels of nurses progressed, self-esteem, their awareness, analytical thinking and communication skills improved.<sup>23</sup> This situation may have affected the increase in sleep quality by providing better control of stress and anxiety.

Women's PTSD severe level was determined to be higher than men's ( $p < .05$ ). These results show that women are more affected by the events. The fact that women are more affected by trauma may be related to their physiological characteristics. Because studies have determined that anxiety and other psychiatric disorders are more frequent and severe in women.<sup>24,25</sup> The reason for this has been shown to be changes in the limbic system and another neuroendocrine system of females, and because of emotional and behavioural reasons caused by genetic predisposition, hormonal effects and culture.<sup>24,26</sup>

In this study, it was determined that married people had better mental health in terms of PTSD, and sleep quality compared with single ( $p < .05$ ). Less stress, anxiety and better sleep quality of married ICU professionals in this study may be related to the social support provided by their spouses.<sup>27</sup>

It was determined that the PTSD levels of ICU professionals who felt pain in the head, neck, nape and waist were high, and their sleep quality was low ( $p < .05$ ). The physical effects of PTSD, anxiety and stress include symptoms such as muscle pain, back pain and headaches, and insomnia.<sup>28</sup> Kızıl et al. reported that head, neck, nape and waist pains are common in health care workers, and this is related to mental problems.<sup>29</sup> In this study, the fact that ICU professionals experience pain, especially in the head, neck, nape and waist regions can be explained by PTSD affects.

According to the results of this study, younger ICU professionals show more severe post-traumatic stress symptoms ( $p < .05$ ). This result is important in terms of showing the role of experience in coping with problems. Lavoie et al. also reported that PTSD decreased in elderly nurses, and they explained the reason for this because older participants learned to use their support systems and solved their problems more easily by interacting with their peers.<sup>30</sup> According to another result determined in this study, as the age of ICU professionals increases, their sleep quality increases, and as the professional experience increases, their PTSD severe level decreases and sleep

quality increases. All these results show that the increase in experience with age has positive effects on the mental health of ICU professionals.

In this study, it was determined that there was a statistically significant negative correlation between the mean scores for the PTSD-SS and the RCSQ ( $r = -0.207$ ) ( $p < .05$ ). A 1-unit increase in the PTSD severe level causes a 0.211-unit decrease in the sleep quality level. It can be said that as the level of PTSD increases, the sleep quality of the participants deteriorates. Levi et al. stated that ICU nurses are at risk for PTSD because of excessive workload, feeling of constant arousal and lack of adequate support, and this can cause attention deficit, decrease in cognitive abilities, burnout, intention to leave, depression, anxiety, sleep disorder and job dissatisfaction.<sup>15</sup> Similarly, Kunzler et al. reported that health professionals experienced mental disorders such as anxiety, depression and PTSD because of their encounters with traumatic situations, and consequently, their sleep quality deteriorated.<sup>31</sup> Peñacoba et al. determined that 58.7% of ICU professionals showed anxiety symptoms during the pandemic period and there was a negative relationship between anxiety and resilience.<sup>32</sup> Sadaf et al. reported that persistent psychological distress in intensive care unit workers negatively affects the individual's private and work life by causing insomnia, loss of appetite and mood disorders.<sup>33</sup> The present study determined that the PTSD and anxiety of ICU professionals affected their sleep quality negatively.

## 7 | LIMITATIONS

This study has some limitations. It was conducted via the internet but not face-to-face. Therefore, during data collection, a formal environment could not be created. In addition, the individual, cultural, social and other factors of the participants that could affect the results of the study could not be controlled. To ensure the quality and rigour of this study, the scales used in the study were developed by experts in the field and tested for validity and reliability, taking care to eliminate the subjective opinions of the researchers and not to manipulate the participants. Therefore, the results are generalisable but can acknowledge that further data could have been useful.

## 8 | IMPLICATIONS FOR PRACTICE

The findings of this study offer some implications for ICU professionals, especially nurses. The prevalence of PTSD is higher in nurses than in others. In addition, sleep quality is low. Therefore, the results of this study can be used to plan interventions to prevent PTSD in nurses and other professionals. Thus, by improving sleep quality, medical errors, burnout and turnover can be reduced, and job and life satisfaction can be increased. A systematic assessment procedure should be established to examine the factors that cause nurses and other professionals to exhibit PTSD symptoms and impair their sleep quality. Managers and colleagues should support each other in the implementation of these procedures.

## 9 | CONCLUSION

In this study, it was determined that the prevalence of PTSD in ICU professionals was 12%. In addition, the increase in the level of PTSD causes their sleep quality to deteriorate. Although it is important to realize these consequences, it is not recommended to make a diagnosis based on these results obtained using scales. These results can only give an idea about the mental health of ICU professionals. Therefore, there is a need to test the results with individual psychiatric interviews. Intensive care units, besides being of vital importance for patients, contain many difficulties for professionals, and PTSD is accepted as a possible outcome of traumatic events experienced by ICU professionals in their practices. So, strategies to facilitate early recognition of potentially traumatic events and PTSD symptoms should be implemented to prevent PTSD in ICU professionals. Peer support, psychoeducation and intensive care simulations can be promising strategies to help ICU professionals cope with their challenging work, and there also is a need to examine the effect of support systems to be given to ICU professionals.

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## CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## PATIENT CONSENT STATEMENT

The study was conducted with intensive care professionals, and written consent was obtained from the participants.

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