Original Article
The occurrence of post-traumatic stress disorder (PTSD), job burnout and its influencing factors among ICU nurses

Ping Li, Huanming Kuang, Huiyi Tan

Department of Nursing, Guangzhou Red Cross Hospital, Jinan University, Guangzhou 510220, Guangdong Province, China

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Abstract: Objective: This study was designed to explore the occurrence of post-traumatic stress disorder (PTSD) symptoms, job burnout and its influencing factors among nurses in intensive care units (ICU). Methods: A total of 150 ICU nurses were selected for questionnaire survey by systematic sampling and 143 questionnaires were returned. The questionnaires included a PTSD Checklist-Civilian Version (PCL-C), Maslach Burnout Inventory (MBI), Connor-Davidson Resilience Scale (CD-RISC) and the Social Support Rating Scale (SSRS). ICU nurses were divided into positive and negative groups according to PCL-C scores, the differences between the groups were compared, and the influencing factors for the occurrence of PTSD were analyzed. Results: ICU nurses had PCL-C scores ranging from 11 to 55 and were divided into the positive group (PCL-C ≥ 38, N=32) and the negative group (PCL-C < 38, N=111) according to the presence of PTSD, with a positive rate of 22.38%. The total MBI scores and scores in emotional exhaustion, depersonalization, and personal accomplishment in the positive group were significantly higher than those in the negative group, (P < 0.05). Health status, years of experience, age, CD-RISC scores, and SSRS scores showed significant difference between the two groups (P < 0.05). Multivariate logistic regression showed that MBI score was an independent risk factor for the development of PTSD symptoms among ICU nurses (OR > 1, P < 0.05), while CD-RISC score was a protective factor (OR < 1, P < 0.05). Conclusion: The incidence rate of PTSD among ICU nurses was 22.38%, and MBI score and CD-RISC score were independent influencing factors for the occurrence of PTSD symptoms.

Keywords: Post-traumatic stress disorder, job burnout, influencing factors, intensive care unit nurses

Introduction

Intensive care units (ICUs) are areas of the hospital where seriously ill patients receive specialized care with specialized equipment and resources [1]. Due to the nature of the ICU, critical care nursing requires an advanced technical skill set and the ability to cope with an increased workload. The ICU is also a frequent area of cardiopulmonary resuscitation, end-of-life issues and medical malpractice disputes. ICU nurses are exposed to stressors for a long time and bear mental stress [2]. It has been reported that the prevalence of PTSD is about 29% among ICU nurses [3]. PTSD is harmful, which limits patients' functional ability and is detrimental to the ICU's role in end-of-life care. Normally, PTSD lasts for a long time and can lead to disability in severe cases. Therefore, timely diagnosis of PTSD in ICU nurses and clarification of the influencing factors for occurrence of PTSD in ICU nurses are of great significance to improve PTSD symptoms and physical and mental health of ICU nurses, so as to improve their work efficiency. Clinical reports show that the occurrence of PTSD is related to job burnout, and PTSD is more likely to occur when job burnout is at a high level [4]. The high morbidity and mortality of their patients has great demands on their daily work. They need to also show care and patience to patients and work on day and night shifts, where they are more likely to experience PTSD. Therefore, this study analyzed the occurrence of PTSD symptoms, job burnout and the influencing factors for occurrence of PTSD among ICU nurses, so
as to provide a reference for reducing the incidence of PTSD among ICU nurses.

**Materials and methods**

**Baseline data**

A systematic sampling method was used to select 150 ICU nurses for questionnaire survey. This study was approved by the Ethics Committee of Guangzhou Red Cross Hospital, Jinan University.

*Inclusion criteria:* (1) ICU nurses who voluntarily participated in the study and signed the informed consent; (2) registered ICU nurses with more than 6 months of work experience.

*Exclusion criteria:* (1) those with severe physical illness; (2) those with a history of mental illness; (3) women during pregnancy or lactation.

A total of 150 questionnaires were distributed in this study, and 143 questionnaires were returned, with a return rate of 95.33%.

**Methods**

*Questionnaires:* PTSD was assessed using a 17-item PTSD Checklist-Civilian Version (PCL-C) [5], which showed good temporal stability, internal consistency, test-retest reliability, sensitivity, specificity and convergent validity. It covered three main syndromes of re-experiencing, avoidance and hypervigilance in 17 items on a 1 to 5 Likert scale, ranging from 17 to 85. Positive PTSD is indicated when the PCL-C is ≥ 38.

The Maslach Burnout Inventory (MBI) [6] is a psychological assessment instrument comprising 22 symptom items on a 0 to 6 Likert scale (6 being every day, 5 being several times a week, 4 being once a week, 3 being several times a month, 2 being once a month, 1 being several times a year, and 0 being none). It covers emotional exhaustion (9 items), depersonalization (5 items), and personal fulfillment (8 items), with the total score as the sum of the three dimensions. A higher score indicates greater emotional exhaustion, depersonalization, with a lower sense of personal accomplishment, and a greater degree of job burnout.

Connor-Davidson Resilience Scale (CD-RISC) consists of 25 items, which are evaluated on a five-point Likert scale ranging from 0-4 in terms of resilience, self-improvement, and optimism. A higher score indicates better resilience [7].

The Social Support Rating Scale (SSRS) consists of 10 items in terms of objective support, subjective support, and social support utilization. A higher score indicates higher social support [8].

**Outcome measurements**

Nurses’ gender, age, education, marital status, years of experience, job title, monthly income, PCL-C, MBI, CD-RISC, and SSRS scores were collected.

**Statistical methods**

The statistical software SPSS 22.0 was used to process the data. The count data of nurses such as gender, age, education, marital status, years of experience, job title, and monthly income were expressed as rates, and were examined by one-way $\chi^2$ test. Measurement data of age, PCL-C, MBI, CD-RISC, and SSRS scores were recorded as $(\bar{x} \pm s)$, and one-way ANOVAs were performed. Those with significant differences in one-way tests were included in multivariate logistic regression analysis. GraphPad Prism 8 was used to illustrate the figures. Differences were considered statistically significant when $P < 0.05$.

**Results**

**Prevalence of PTSD symptoms among ICU nurses**

ICU nurses scored 11 to 55 on the PCL-C, (9.52±3.87) on re-experiencing, (12.25±3.76) on avoidance, and (9.92±3.34) on hypervigilance, with a total score of (31.70±9.21). There were 32 nurses in the positive group (PCL-C ≥ 38) and 111 nurses in the negative group (PCL-C < 38), with a positive rate of 22.38% (Figure 1A).

**Burnout in ICU nurses**

In the positive group, the MBI scores and scores of emotional exhaustion, depersonalization, and personal accomplishment were (58.69±7.10) points, (24.44±3.66) points, (8.59±2.37) points, and (25.66±3.41) points, respectively, which were significantly higher than those of
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Influencing factors for the occurrence of PTSD among ICU nurses

The differences were not significant in gender, education, marital status, title, and monthly income between the two groups of nurses ($P > 0.05$); while the differences were statistically significant in health status, years of work, age, CD-RISC score, and SSRS scores between the two groups ($P < 0.05$) (Table 1).

Multivariate analysis of influencing factors for the occurrence of PTSD among ICU nurses

PTSD was taken as the dependent variable (PTSD positive was assigned “1”, and PTSD negative was assigned “0”), and the single factor analysis result $P < 0.05$ was taken as the independent variable (poor health and working years of < 3 years were assigned “1”, good health and working years of 3-5 years were assigned “2”, working years of 6-10 years were assigned “3”, and working years of > 10 years were assigned “4”). MBI score was an independent risk factor for occurrence of PTSD among ICU nurses ($OR > 1, P < 0.05$), while CD-RISC score was a protective factor ($OR < 1, P < 0.05$) (Table 2).

Discussion

PTSD is a psychological trauma caused by catastrophic and extraordinary traumatic events. It was originally used to reflect the mental health disorders caused by war. Later, people gradually discovered that violent attacks, natural disasters, deaths of relatives, occupational stress and other events can lead to PTSD [9]. It has been found that PTSD is more common among ICU nurses because they are prone to mental trauma due to the heavy workload of ICU nurses, traumatic events such as sudden emergencies or changes in conditions, and occasional bullying from colleagues [10, 11]. This study found that ICU nurses scored 11 to 55 on the PCL-C, (9.52±3.87) for re-experiencing, (12.25±3.76) for avoidance, and (9.92±3.34) for high vigilance, with a total score of (31.70±9.21) and a positive rate of 22.38%, indicating a high prevalence of PTSD among ICU nurses and the need for targeted intervention.

Reports in recent years have also shown a high incidence of job burnout among medical staff [12, 13]. Burnout is a psychological and physical fatigue syndrome caused by prolonged occupational stress, which can lead to emotional, attitudinal, and behavioral exhaustion in individuals, and it severely affects the quality and productivity of workers [14]. In this study, total MBI scores and scores on three dimensions in the positive group were significantly higher than those in the negative group, and MBI score was an independent risk factor for PTSD occurrence in ICU nurses, suggesting that the occurrence of PTSD is closely related to all dimensions of burnout. The reason may be that when ICU nurses have severe emotional exhaustion, depersonalization, low personal fulfillment, and low stress tolerance, their brain may experience a dissociative state to avoid the pain caused by the work [15].

A study has found that the occurrence of PTSD is related to family and psychosocial factors [16]. The present study showed that the difference between the two groups of nurses in terms of gender, education level, marital status, job title, and monthly income was not significant, slightly different from results of previous studies. Due to the physical differences
between females and males, females are more flexible and tend to reveal inner feelings better and have a higher incidence of PTSD than males [17]. However, no difference was obser-
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In this study, it was found that the incidence of PTSD is higher in divorced or separated individuals than in those in a harmonious family. However, the present study found that marital status did not affect the occurrence of PTSD, which may be due to a small sample size. Moreover, the effect of title and monthly income on the occurrence of PTSD in this study was not significant, which is consistent with the results of other studies.

In conclusion, the incidence rate of PTSD was 22.38% among ICU nurses, and the occurrence of PTSD was associated with health status, years of work, age, CD-RISC score, and SSRS score, where MBI score was an independent risk factor and CD-RISC score was an independent protective factor for the occurrence of PTSD. The limitations are that the small sample size included may have an impact on the study results, and in-depth studies with larger samples are still needed in the future.

Disclosure of conflict of interest

None.

Address correspondence to: Huiyi Tan, Department of Nursing, Guangzhou Red Cross Hospital, Jinan University, No. 396, Tongfuzhong Road, Haizhu District, Guangzhou 510220, Guangdong Province, China. Tel: +86-020-84413799; E-mail: tanhuiyi99@21cn.com

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