

Prevalence of Posttraumatic Stress Disorder and Related Factors Among Patients Discharged From Critical Care Units in Kashan, Iran

Zohreh Sadat,¹ Mohammad Abdi,^{2,*} and Mohammad Aghajani¹

¹Trauma Nursing Research Center, Kashan University of Medical Sciences, Kashan, IR Iran

²Department of Nursing, School of Nursing and Midwifery, Kashan University of Medical Sciences, Kashan, IR Iran

*Corresponding author: Mohammad Abdi, Department of Nursing, School of Nursing and Midwifery, Kashan University of Medical Sciences, Kashan, IR Iran. Tel: +98-36155540021, Fax: +98-36155546633, E-mail: m.abdi252@yahoo.com

Received: March 6, 2015; Revised: June 10, 2015; Accepted: June 22, 2015

Background: Posttraumatic Stress Disorder (PTSD) is a severe anxiety disorder occurred due to past adverse experiences. Several researches have demonstrated that PTSD is quite common among patients discharged from critical care unit.

Objectives: This study aimed to investigate the prevalence of PTSD and its related factors among patients discharged from critical care units in Kashan, Iran, during 2014.

Patients and Methods: A descriptive prospective study was performed on 332 patients admitted to critical care units of Kashan Shahid Beheshti Hospital using a convenience sampling method. Data were collected in wards during hospitalization and one month after their discharge from hospital using questionnaires on demographic, medical information and PTSD Checklist (PCL). The PCL scores of 45 or more were considered as PTSD. Data were analyzed using chi-square, t-test, Mann-Whitney U and logistic regression.

Results: From a total of 332 patients, 160 cases (48.2%) had PTSD and the mean total PCL score in participants was 44.24 ± 19.89 . There was a significant difference between the total score of PTSD and its domains in patients with and without PTSD. The univariate analysis showed a significant association between PTSD and increasing age, increased length of hospital stay, more children, having additional comorbidities, unemployed, use of mechanical ventilation ($P < 0.001$), drug abuse ($P = 0.003$) and single patients ($P = 0.028$). However, there was no significant association between PTSD and gender, type of the critical care unit, level of education and admission due to trauma. However, in multivariate analysis using logistic regression, factors associated with PTSD were older age of the participants, use of mechanical ventilation having additional comorbidities, unemployed ($P < 0.001$) and being single ($P = 0.04$).

Conclusions: Prevalence of PTSD is high among patients discharged from ICUs and some medical individual factors such as elderly, unemployed, being single, using mechanical ventilation and pre-existing diseases are risk factors. Therefore, it is recommended to perform appropriate educational plan for these patients to reduce the risk of PTSD.

Keywords: Posttraumatic Stress Disorder; Critical Care Unit; Patient

1. Background

Posttraumatic Stress Disorder (PTSD) is a severe anxiety disorder in which patients persistently re-experience a past traumatic event (1, 2). Today, with advances in technology and medical equipment, mortality rate of patients is reduced. However, patients discharged from critical care units might have high rates of physical and psychological complications (3, 4). Psychological disorders such as depression, anxiety and PTSD are some of these complications (5). According to Jones et al., the proportion of PTSD was 9.2% ranged from 3.2% to 14.8% in different Intensive Care Units (ICUs) survivors three months after discharge (6). Moreover, in a study by Wallen et al. (7), the rate of PTSD was 13% and in a review study the prevalence of PTSD reported from 17% to 30% in ICUs (8). A study in Iran reported the rate of acute stress and PTSD as 30% and 22%, respectively in traffic accident patients hospitalized in an orthopedic unit (9).

Studies show that patients admitted to ICUs may expe-

rience some psychological problems due to aggressive interventions and using equipment such as ventilators, dialysis apparatus and defibrillators (10-12). Posttraumatic stress disorder often occurs in patients one month after discharge from the ICU (13, 14). Consequently, patient would have a substantial decrease in quality of life, impairment in interpersonal and social relationships, sexual dysfunction, impotence and feeling of frustration, fear and impending death (15-17). Moreover, neurological disorders and malnutrition may occur (18, 19).

In 2007, the costs of PTSD in the United States were about 44 billion dollars with more than 23 billion dollars paid for direct therapeutic costs (14). Posttraumatic stress disorder is more prevalent in people who experienced traumatic events such as traffic accidents, quarrels, war or natural disasters such as hurricanes and earthquakes. It may also appear in sports such as boxing and taekwondo (20, 21). Symptoms of this disorder have been seen after life threat-

ening cardiovascular and respiratory diseases or patients with cancer (13, 20). There are some related factors to PTSD. An epidemiological study showed that PTSD was more prevalent in females than males and also in aged people than young ones (22). However, no gender difference was observed regarding the prevalence of PTSD in patients discharged from ICU (7). Other studies showed that PTSD was more prevalent in patients with trauma (23) in those with substance abuse and patients with long-term hospitalization (10). However, some other studies found no significant association between substance abuse or length of hospitalization and experiencing PTSD symptoms (9, 24). This study was performed due to limited performed studies in Iran and considering physical, psychological, social and economic consequences of PTSD and controversies about its prevalence and affecting factors.

2. Objectives

The present study aimed to investigate the occurrence of PTSD and related factors in patients discharged from critical care units of Kashan Shahid Beheshti hospital in 2014.

3. Patients and Methods

This descriptive prospective study was conducted on patients hospitalized in critical care units including postcardiac surgery unit, general intensive care unit and coronary care unit of Shahid Beheshti Hospital in Kashan City from June to December 2014. A convenience sampling method was used to recruit patients in the study. Inclusion criteria were having a history of hospitalization for more than 24 hours in one of the above-mentioned units, willingness to participate in the study, living in Kashan for at least one month after discharge from hospital, being available for the researchers, being conscious and oriented to answer the study questionnaire and not having a known mental or psychological disorder.

3.1. Sampling

Sample size was estimated based on a previous study in which the prevalence of PTSD was 33% in patients received intensive care (5). Then 330 samples were estimated to be needed based on the following parameters ($\alpha = 0.05$, $\beta = 0.80$ and sampling error of 0.05). However, 360 samples were recruited to compensate a possible attrition rate of 10%. Finally, 332 subjects were participated in the study.

3.2. Measurements

A two-part instrument was used for data collection. The first part consisted of 11 questions about demographic characteristics and clinical information including age, gender, education level, occupation, sibling, reasons for hospitalization, length of hospital stay, name of the ward, using mechanical ventilation, history of substance abuse, history of other comorbidities and patient's telephone number that were completed through interview-

ing patients and using patients' hospital records. An informed consent was obtained from the participants before study enrollment and at the one-month follow-up.

The Persian version of PTSD Checklist (PCL) was used as the second part of the instrument. This part was answered by patients (or through individual structured interview, if a patient was illiterate) one month after hospital discharge, when patients came back for a medical visit or through a home visit by the first researcher (if a patient did not refer for medical visit). All home visits were arranged after a telephone call to patients and obtaining their verbal agreement. The Persian version of PCL was previously validated by Goudarzi et al. (25) and showed appropriate psychometric properties. However, we reassessed the reliability of the PCL through split half method and its Cronbach's alpha was 0.87. The PCL consists of 17 items in three domains. The first domain includes 5 items related to the signs and symptoms of re-experiencing the traumatic event, the second domain includes 7 items on symptoms of emotional numbness and avoidance and the third domain includes 5 items about the signs and symptoms of excessive arousal. All items were answered on a 5-point Likert scale from 1 to 5. The PCL scores range from 17 to 85 with a cut-off of 45 (26).

3.3. Ethical Consideration

The study was approved by the ethics committee of Kashan university of medical sciences. All subjects signed a written informed consent before the study enrollment and at the one-month follow-up. The study objectives and designs were explained to patients and they were free to withdraw from the study at any time during the study.

3.4. Data Analysis

Data analysis was performed using SPSS v 11.5. Kolmogorov-Smirnov test was used to examine the normal distribution of data. Chi-square test was used to examine the association between dichotomous variables. Moreover, t-test was used to examine the differences between the mean scores of quantitative variable with normal distribution and Mann-Whitney U test for the comparison of non-normal quantitative variables. Moreover, multivariate analysis by logistic regression was used to define independent predictors of PTSD. A P values less than 0.05 was considered as statistically significant in all tests.

4. Results

The mean age of all patients was 54 ± 16.15 years and 191 patients (57.7%) were males. Overall, 48.2% of patients in ICUs ($n = 160$) had symptoms of PTSD based on PCL score ≥ 45 . The mean PCL score was 44.24 ± 19.89 in all samples.

Results showed that mean age of patients with PTSD was more than that of patients without PTSD (60.49 ± 16.8 versus 49.4 ± 13.5). Chi-square test and t test were used to examine the association between patients' demographic and clinical characteristics and experiencing PTSD (Table 1).

Table 1. Association Between Demographic and Clinical Characteristics and Posttraumatic Stress Disorder Based on Univariate Analysis^a

Predictors	PTSD		OR, 95% CI	P Value
	No, n = 172 ^b	Yes, n = 160 ^b		
Gender^b			1.02 (0.81 - 1.26)	0.83
Male	98 (51.3)	93 (48.7)		
Female	74 (52.5)	67 (47.5)		
Age, y^c	49.40 ± 13.50	60.49 ± 16.80		< 0.001
Job^b			1.86 (0.94 - 3.7)	< 0.001
Employee	137 (64.6)	75 (35.4)		
Unemployed	35 (29.2)	85 (70.8)		
Marital Status^b			2.86 (1.08-7/57)	0.028
Married	166 (53.4)	145 (46.6)		
Single	6 (28.6)	15 (71.4)		
Number of Children^c	3.92 ± 1.40	4.88 ± 1.72		< 0.001
Educational level^b			1.095 (0.7 - 1.70)	0.69
Illiterate and Elementary	106 (51.0)	102 (49.0)		
High school and above	66 (53.2)	58 (46.8)		
Hospital stay (Day)^c	5.65 ± 4.52	8.87 ± 4.95		< 0.001
Type of critical care unit^b			0.94 (0.61-1.45)	0.79
GICU, PCSICU	76 (51.0)	73 (49.0)		
CCU	96 (52.5)	87 (47.5)		
Admission for trauma reason^b			1.08 (0.7-1.65)	0.734
Yes	10 (55.6)	8 (44.4)		
No	162 (51.6)	152 (48.4)		
Mechanical ventilation^b			5.73 (3.45 - 9.50)	< 0.001
Yes	29 (25.2)	86 (74.8)		
No	143 (65.9)	74 (34.1)		
Additional co-morbidities^b			6.78 (4.10-10.91)	< 0.001
Yes	54 (30.85)	121 (69.15)		
No	118 (75.15)	39 (24.85)		
Drug abuse^b			2.52 (1.95 - 3.25)	0.003
Yes	13 (30.23)	30 (69.77)		
No	159 (55.02)	130 (44.98)		

^a Abbreviations: CCU, coronary care unit; GICU, general intensive care unit; PCSICU, Postcardiac surgical intensive care unit.

^b The values are presented as No (%)

^c The values are presented as mean ± standard deviation

Table 2. Association Between Demographic and Clinical Characteristics and Posttraumatic Stress Disorder Based on Multivariate Analysis^a

Predictors	B	S.E.	Wald	df	P value	EXP(B)	95% CI
Age, y	0.040	0.010	15.949	1	<0.001	1.040	1.020-1.061
Number of children	0.195	0.100	3.781	1	0.051	1.216	0.998-1.481
Hospital stay, d	0.037	0.031	1.449	1	0.229	1.038	0.977-1.102
Employment status (unemployed)	1.100	0.297	13.718	1	<0.001	3.004	1.678-5.375
Marital status (single)	1.659	0.810	4.199	1	0.040	5.254	1.075-25.687
Mechanical ventilation (yes)	1.249	0.326	14.704	1	<0.001	3.487	1.842-6.603
Additional comorbidities (yes)	1.173	0.310	14.334	1	<0.001	3.230	1.760-5.927
Drugs abuse (yes)	0.678	0.422	2.585	1	0.108	1.970	0.862-4.500

^a Age, number of children and hospital stay were included in model as continuous variables and others were included as categorical variables. Reference categories defined as: employment status (employed), marital status (married), mechanical ventilation (no), additional comorbidities (no) and drugs abuse (no).

Results showed that PTSD was more prevalent among single patients, unemployed patients and in those older patients, having more children and longer hospitalization and having a history of drugs abuse. The PTSD was also more common among patients with additional comorbidities and those who used ventilator during intensive care. In multivariate analysis, older age, having additional comorbidities, unemployed, being single and using mechanical ventilation during intensive care were predictors of PTSD (Table 2).

However, no significant relationships were observed between patients' gender, admission due to trauma, type of the critical care unit, level of education and PTSD by univariate and multivariate analyses.

5. Discussion

Results of the present study showed that more than 48% of the patients who received intensive care experienced postdischarge PTSD. Moreover, some individuals and clinical characteristics were related to PTSD. Khodadady et al. studied the prevalence of PTSD after traffic accidents and in traffic related injured patients in Rasht City in Iran. They reported that acute stress disorders were occurred in 30.3% and 22.5% of the participants, respectively (9). Wallen et al. in the United States conducted a prospective cohort study on 137 patients who received intensive care and reported that 13% of them experienced PTSD during a nine-month follow-up (7). The difference between the prevalence of PTSD in the present study and what reported by Wallen et al. might be attributed to the fact that they followed 100 patients discharged from different types of ICU and the Impact of Event Scale (IES)-revised was used to assess PTSD.

In the present study, a significant association was found between subjects' age and experiencing postdischarge PTSD, so that PTSD was more frequent in patients older age. The mean age of patients with PTSD was also significantly higher than those without PTSD. These findings were consistent with the results of previous investigations that studied the prevalence of PTSD in patients after intensive care discharge or the general population (12, 22, 27-29). However, other studies reported that age has no significant effect on the prevalence of PTSD (5, 14, 30, 31). The discrepancies between studies might be attributed to different samples studied as well as different instruments used. For example, Boer mostly studied patients with abdominal sepsis (30). In the present study, no significant association was found between gender and experiencing PTSD. This finding was consistent with the results of Wallen et al. and results of other investigators (5, 7, 29, 30, 32, 33) who could not find any significant gender difference in the prevalence of PTSD. In contrast, some studies reported that the risk of experiencing PTSD is double in females than males both in the general population and patients receiving intensive care (12, 19, 22, 27, 34). The controversial results between these studies and

our result might be attributed to different samples. For example, Breslau et al. (22) studied young adults and Samuelson et al. (27) studied patients with mechanical ventilation.

In the current study, the prevalence of PTSD was higher in single subjects than married ones. This finding was inconsistent with Myhren et al. (5). They studied PTSD in patients during the first year after ICU discharge and reported that the prevalence of this disorder was not higher in single individuals than married ones. In the current study, the mean level of PTSD symptoms in patients was assessed one year following ICU treatment and the tool for assessing PTSD was the IES, but in our study PTSD was evaluated one month after ICU discharge and patients completed the PCL Scale. Higher frequency of PTSD in single patients indicates that being single might be contributed negatively to well-being.

Our results demonstrated that PTSD was more prevalent among unemployed patients, this difference was significant in multivariate analysis. However, Myhren et al. in a study of patients discharged from ICU reported that most people who experienced PTSD were unemployed (5). In this study, factors associated with delayed onset of PTSD symptoms (12 months after discharge) were assessed using multivariate regression analyses and only 27 patients entered the analysis. In the current study, PTSD was more prevalent in patients with increasing length of ICU stay. However, logistic regression did not show a significant difference between length of hospital stay and PTSD. This finding was consistent with the results of Senningsen who studied delirium and PTSD in 614 patients discharged from the ICU (13). Another researcher did not find any association between length of hospital stay and rate of PTSD (35). Several other studies reported an increase in post intensive care PTSD with increasing the duration of ICU stay (29, 30, 32). In these studies, PTSD was evaluated in patients with abdominal sepsis or acute lung injury, also follow-up for determination of PTSD was longer after discharge compared to our study.

In the present study, the prevalence of PTSD increased in patients with a history of mechanical ventilation. This finding was in line with other studies; for example, Girard et al. who studied PTSD after critical illness requiring mechanical ventilation (36). Results showed a significant association between having additional comorbidities (i.e. chronic cardiovascular problems) and the occurrence of postdischarge PTSD. Rebecca et al. reported that those with a prolonged history of comorbidities are in higher risk for experiencing PTSD (21). It seems that having additional comorbidities might increase the rate of aggressive medical interventions such as mechanical ventilation or hemodialysis during intensive care and consequently the risk of postdischarge PTSD might be increased. In our study, no significant difference was found between the prevalence of postdischarge PTSD in patients with or without trauma. Wallen et al. also could not find a difference in the prevalence of postdischarge PTSD

in patients with or without trauma (7). However, Richter et al. reported that PTSD is more prevalent in trauma patients than those without trauma (23), which might be attributed to the small sample size and the type of studied patients. Our results showed that the prevalence of PTSD increased in patients with a history of drugs abuse. However, Davydow et al. showed that patients with a history of drug or alcohol abuse are at risk of increasing PTSD (37). Drugs or alcohol abuse can put these patients at risk of withdrawal (38); also, higher doses of analgesics may be needed due to intolerance of pain (39); so, these patients are at a higher risk of PTSD. In a study, high levels of PTSD symptoms were most likely to occur in those receiving high doses of lorazepam (12).

More than 48% of patients in the present study experienced postintensive care PTSD. Moreover, significant associations were found between experiencing postintensive care PTSD and variables such as age, using ventilators, having additional comorbidities unemployed and single patients. Due to negative effects of PTSD on patients' quality of life, it is necessary to educate patients regarding preventive measures and establish a postdischarge follow-up care to diagnose susceptible patients and help them in better management of this unpleasant side effect of critical illnesses and intensive care. Then, the prevalence and complications of postintensive care PTSD might be reduced.

Acknowledgements

The authors are deeply thankful to the research deputy of Kashan university of Kashan faculty of nursing and midwifery. Also, the authors are grateful to all patients who participated in this research and deeply thankful to all nurses and physicians of critical care units of Kashan Shahid Beheshti hospital.

Authors' Contributions

Zohereh Sadat and Mohammad Abdi contributed in planning, prepared the first draft and critical revisions of the manuscript. Zohereh Sadat supervised the study and did the data analysis. Mohammad Abdi involved in data collection. Mohammad Aghajani contributed in the study conception and design and supervised the study and helped in critical revision of the manuscript.

Funding/Support

This study was granted by the research deputy of Kashan University of Medical Sciences with the grant number of 9365.

References

- Jones C, Backman C, Capuzzo M, Egerod I, Flaatten H, Granja C, et al. Intensive care diaries reduce new onset post traumatic stress disorder following critical illness: a randomised, controlled trial. *Crit Care*. 2010;**14**(5):R168.
- Mahjoubipour H, Mohammdi M, Salmani F, Saneei F. Survey of SOFA scoring system on predicting mortality rate and length stay in intensive care unit for patients of Al-Zahra hospital of Isfahan. *Med Surg Nurs J*. 2012;**1**(2):6-10.
- Campbell AJ, Cook JA, Adey G, Cuthbertson BH. Predicting death and readmission after intensive care discharge. *Br J Anaesth*. 2008;**100**(5):656-62.
- Rovatti KB, Teodoro M, Castro E. Memories and prevalence of posttraumatic stress disorder in intensive care units. *Psicologia: Reflexão e Crítica*. 2012;**25**(3):499-505.
- Myhren H, Ekeberg O, Toien K, Karlsson S, Stokland O. Posttraumatic stress, anxiety and depression symptoms in patients during the first year post intensive care unit discharge. *Crit Care*. 2010;**14**(1):R14.
- Jones C, Backman C, Capuzzo M, Flaatten H, Rylander C, Griffiths RD. Precipitants of post-traumatic stress disorder following intensive care: a hypothesis generating study of diversity in care. *Intensive Care Med*. 2007;**33**(6):978-85.
- Wallen K, Chaboyer W, Thalib L, Creedy DK. Symptoms of acute posttraumatic stress disorder after intensive care. *Am J Crit Care*. 2008;**17**(6):534-43.
- Andrea V, Santesso CP, Araujo AS. Post-traumatic stress disorder in intensive care unit patients. *Rev Bras Ter Intensiva*. 2010;**22**(1):77-84.
- Khodadady E, Golparvar E, et al. frequency of acute stress and post-traumatic disorder in traffic -related injured patients, hospitalized in porsina hospital rasht, iran 2010. *J Rafsanjan Univ Med Sci*. 2012;**11**(4):347-54.
- Foa EB, Keane TM, Friedman MJ, Cohen JA. *Effective treatments for PTSD: practice guidelines from the International Society for Traumatic Stress Studies*. Guilford Press; 2008.
- Wade D, Hardy R, Howell D, Mythen M. Identifying clinical and acute psychological risk factors for PTSD after critical care: a systematic review. *Minerva Anesthesiol*. 2013;**79**(8):944-63.
- Girard TD, Shintani AK, Jackson JC, Gordon SM, Pun BT, Henderson MS, et al. Risk factors for post-traumatic stress disorder symptoms following critical illness requiring mechanical ventilation: a prospective cohort study. *Crit Care*. 2007;**11**(1):R28.
- Svenningsen H. Associations between sedation, delirium and post-traumatic stress disorder and their impact on quality of life and memories following discharge from an intensive care unit. *Dan Med J*. 2013;**60**(4):B4630.
- Scragg P, Jones A, Fauvel N. Psychological problems following ICU treatment. *Anaesthesia*. 2001;**56**(1):9-14.
- Zyl MV, Oosthuizen P, Seedat S. Post traumatic stress disorder: undiagnosed cases in a tertiary inpatient setting. *Afr J Psychiatry*. 2008;**11**(2):119-22.
- Guler E, Schmid JP, Wiedemar L, Saner H, Schnyder U, von Kanel R. Clinical diagnosis of posttraumatic stress disorder after myocardial infarction. *Clin Cardiol*. 2009;**32**(3):125-9.
- Davidson JE, Harvey MA, Schuller J, Black G. Post-intensive care syndrome: What it is and how to help prevent it. *Am Nurs Today*. 2013;**8**(5):32-8.
- Volk B, Grassi F. Treatment of the post-ICU patient in an outpatient setting. *Am Fam Physician*. 2009;**79**(6):459-64.
- Capuzzo M, Valponi V, Cingolani E, Gianstefani G, De Luca S, Grassi L, et al. Post-traumatic stress disorder-related symptoms after intensive care. *Minerva Anesthesiol*. 2005;**71**(4):167-79.
- Kishen R. Post-traumatic stress disorder in the critically ill patients. *Indian J Crit Care Med*. 2006;**10**(3):163.
- Rebecca M, Mary P, Jean-Paul S, Ulrich S, Jurgen B, Hansjorg Z. Myocardial Infarction - Stress Prevention:INTervention (MI-SPRINT) to reduce the incidence of posttraumatic stress after acute myocardial infarction through trauma-focused psychological counseling: study protocol for a randomized controlled trial. *Bio Med Central*. 2013;**14**(1):329-40.
- Breslau N, Anthony JC. Gender differences in the sensitivity to posttraumatic stress disorder: An epidemiological study of urban young adults. *J Abnorm Psychol*. 2007;**116**(3):607-11.
- Richter JC, Waydhas C, Pajonk FG. Incidence of posttraumatic stress disorder after prolonged surgical intensive care unit treatment. *Psychosomatics*. 2006;**47**(3):223-30.
- Rock LF. Sedation and its association with posttraumatic stress

- disorder after intensive care. *Crit Care Nurse*. 2014;**34**(1):31-9.
25. Goudarzi MA. validation and reliability of the Mississippi Scale for Posttraumatic Stress. *J Psychol*. 2003;**2**(7):153-77.
26. Blanchard E. Psychometric properties of the PTSD checklist (PCL). *Behav Res Ther*. 1996;**34**(8):669-73.
27. Samuelson KA, Lundberg D, Fridlund B. Stressful memories and psychological distress in adult mechanically ventilated intensive care patients - a 2-month follow-up study. *Acta Anaesthesiol Scand*. 2007;**51**(6):671-8.
28. Cuthbertson BH, Hull A, Strachan M, Scott J. Post-traumatic stress disorder after critical illness requiring general intensive care. *Intensive Care Med*. 2004;**30**(3):450-5.
29. Rattray JE, Johnston M, Wildsmith JA. Predictors of emotional outcomes of intensive care. *Anaesthesia*. 2005;**60**(11):1085-92.
30. Boer KR, van Ruler O, van Emmerik AA, Sprangers MA, de Rooij SE, Vroom MB, et al. Factors associated with posttraumatic stress symptoms in a prospective cohort of patients after abdominal sepsis: a nomogram. *Intensive Care Med*. 2008;**34**(4):664-74.
31. Schelling G, Stoll C, Haller M, Briegel J, Manert W, Hummel T, et al. Health-related quality of life and posttraumatic stress disorder in survivors of the acute respiratory distress syndrome. *Crit Care Med*. 1998;**26**(4):651-9.
32. Dowdy DW, Bienvenu OJ, Dinglas VD, Mendez-Tellez PA, Sevransky J, Shanholtz C, et al. Are intensive care factors associated with depressive symptoms 6 months after acute lung injury? *Crit Care Med*. 2009;**37**(5):1702-7.
33. Perrins J, King N, Collings J. Assessment of long-term psychological well-being following intensive care. *Intensive Crit Care Nurs*. 1998;**14**(3):108-16.
34. Ratzler M, Brink O, Knudsen L, Elklit A. Posttraumatic stress in intensive care unit survivors - a prospective study. *Health Psychol Behav Med*. 2014;**2**(1):882-98.
35. Jones C, Griffiths RD, Humphris G, Skirrow PM. Memory, delusions, and the development of acute posttraumatic stress disorder-related symptoms after intensive care. *Crit Care Med*. 2001;**29**(3):573-80.
36. Kress JP, Gehlbach B, Lacy M, Pliskin N, Pohlman AS, Hall JB. The long-term psychological effects of daily sedative interruption on critically ill patients. *Am J Respir Crit Care Med*. 2003;**168**(12):1457-61.
37. Davydow DS, Zatzick DF, Rivara FP, Jurkovich GJ, Wang J, Roy-Byrne PP, et al. Predictors of posttraumatic stress disorder and return to usual major activity in traumatically injured intensive care unit survivors. *Gen Hosp Psychiatry*. 2009;**31**(5):428-35.
38. de Wit M, Wan SY, Gill S, Jenvey WI, Best AM, Tomlinson J, et al. Prevalence and impact of alcohol and other drug use disorders on sedation and mechanical ventilation: a retrospective study. *BMC Anesthesiol*. 2007;**7**:3.
39. Davydow DS, Gifford JM, Desai SV, Needham DM, Bienvenu OJ. Posttraumatic stress disorder in general intensive care unit survivors: a systematic review. *Gen Hosp Psychiatry*. 2008;**30**(5):421-34.