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Research Article

Retrospective evaluation of post-traumatic stress disorder data of healthcare workers who received counseling from psychosocial support unit after the kahramanmaraş earthquake

Kahramanmaraş depremi sonrası psikososyal destek biriminden danışmanlık alan sağlık çalışanlarının travma sonrası stres bozukluğu verilerinin retrospektif değerlendirilmesi

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Abstract

Aim: Healthcare workers seem to be a neglected professional group when helping other people during disasters. This study aimed to determine the Post-Traumatic Stress Disorder(PTSD) levels of healthcare workers and the risk factors for PTSD after the Kahramanmaraş Earthquake.

Material and Methods: Sociodemographic, clinical, National Stressful Events Survey Short Scale (NSESSS) ASD (Acute Stress Disorder) and PTSD data of healthcare professionals working at Dicle University Hospital who applied to the psychosocial support unit after the February 6 Kahramanmaraş earthquake were examined retrospectively. Data from 102 people who were evaluated twice in the first and second 30 days after the earthquake were included in our study.

Results: Participants' mean age was 32.70±8.26 years. 52% of the participants were women, 49% were married, and 42.2% had a child/children. The rates of professions were distributed as follows: 38.2% physician, 35.3% nurse, and 26.5% other healthcare workers. PTSD scores were significantly higher in those with children than in those without, in nurses than in doctors, and in those with a psychiatric history than in those without. Gender, marital status, and psychiatric family history did not significantly affect the scale scores. According to simple linear regression analysis, ASD scores predicted PTSD scores %40.6.

Conclusion: High NSESSS-ASD scores, having a child/children, being a nurse, and having a psychiatric history were found to be risk factors for developing PTSD in healthcare workers. Risk groups for PTSD in healthcare workers should be identified through studies with larger samples and more extended follow-up periods, and protective measures should be taken.

Keywords: Post-Traumatic Stress Disorder, Acute Stress Disorder, Healthcare Workers, Psychological Trauma, Earthquake

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Öz

Amaç: Sağlık çalışanları felaket dönemlerinde diğer insanlara yardım ederken ihmal edilen bir meslek grubu gibi görünmektedir. Bu çalışmada Kahramanmaraş Depremi sonrasında sağlık çalışanlarının Travma Sonrası Stres Bozukluğu (TSSB) düzeyleri ile risk faktörlerinin belirlenmesi amaçlandı.

Gereç ve Yöntemler: Dicle Üniversitesi Hastanesi'nde çalışan, 6 Şubat Kahramanmaraş depremi sonrası psikososyal destek ünitesine başvuran sağlık çalışanlarının sosyodemografik, klinik, Ulusal Stresli Olaylar Araştırması Kısa Ölçeği (NSESSS) ASB ve TSSB verileri geriye dönük olarak incelendi. Çalışmamıza depremi sonrası ilk 30 gün ve ikinci 30 günde iki kez değerlendirmeye alınan 102 kişinin verileri dahil edildi.

Bulgular: Katılımcıların yaş ortalaması 32,70±8,26 yıldı. %52'si kadın, %49'u evliydi ve %42,2'sinin çocuk sahibiydi. %38,2'si hekim, %35,3'ü hemşire ve %26,5'i diğer sağlık çalışanıydı. TSSB skorları çocuğu olanlarda olamaynalara göre, heşmşirelerde doktorlara göre, psikiyatrik özgeçmişi olanlarda olmayanlara göre anlamlı düzeyde yüksekti. Cinsiyet, medeni durum, psikiyatrik soygeçmişin ise ölçek skorlarına anlamlı etkisi yoktu. Basit doğrusal regresyon analizine göre ASB puanları TSSB puanlarını %40,6 yordamaktaydı.

Sonuçlar: Yüksek NSESSS-ASB skorları, çocuk sahibi olmak, hemşire olmak, psikiyatrik özgeçmişi olmak sağlık çalışanlarında TSSB geliştirmek için risk faktörleri olarak bulundu. Daha geniş örneklemli, daha uzun takip süreli çalışmalarla sağlık çalışanlarında TSSB için risk grupları tespit edilmeli ve koruyucu önlemler alınmalıdır.

Anahtar Kelimeler: Travma Sonrası Stres Bozukluğu, Akut Stres Bozukluğu, Sağlık Çalışanları, Psikolojik Travma, Deprem

Introduction

On 06.02.2023, two earthquakes of magnitude M7.7 and 7.6 occurred at 04:17 and 13:24 local time, with the epicenter in Kahramanmaraş. The earthquake affected a wide geographical area and caused great destruction in 11 provinces (Kahramanmaraş, Hatay, Adıyaman, Gaziantep, Malatya, Kilis, Diyarbakır, Adana, Osmaniye, Şanlıurfa and Elazığ) in Turkey. More than fifty thousand people lost their lives, and more than 100 thousand people were injured (1).

Trauma is defined as experiencing actual or threatened death, serious injury, or sexual assault in one of the following ways: i) Directly experiencing a traumatic event, ii) Seeing directly what happens to others, iii) Learning that a traumatic event has happened to a family member or close friend iv) Recurrent or excessive exposure to unpleasant details of the traumatic event (2).

Acute Stress Disorder (ASD) is defined as involuntary symptoms, negative mood, dissociative, avoidance, and arousal symptoms occurring within 3 to 30 days after a traumatic event. If these symptoms persist for more than 30 days, the diagnosis is Post-Traumatic Stress Disorder (PTSD) (2).

Factors such as the type of trauma, diagnosis of ASD, gender, marital status, history of psychiatric disorder, and family history of psychiatric disorder affect the development of PTSD (3).

There is evidence to suggest that survivors of exposure to traumatic events such as physical or sexual assault and natural disasters are at risk of suffering from post-traumatic stress symptoms. Previous studies have shown that 57-83% of cases with ASD develop PTSD in the subsequent period and that ASD is a risk factor for PTSD. In a study that evaluates the ability of ASD to predict PTSD in China, the severity of ASD symptoms was found to correlate with later PTSD symptoms in a sample of 197 people who experienced the Lushan earthquake (4).

Early intervention in cases of ASD may reduce the likelihood of developing long-term psychiatric disorders, according to several studies (5). Therefore, it is crucial to identify patients with ASD after traumatic events.

Since Turkey is an earthquake country, PTSD has been studied in many groups after the earthquakes, but it has been determined that there is no study related to healthcare workers. Healthcare professionals seem to be neglected while helping other people in these processes.

In this study, we aimed to determine the PTSD levels of healthcare workers and the risk factors for PTSD after the Kahramanmaraş Earthquake.

Material and Methods

1.Sample selection

Criteria for inclusion in the study: i. Having been working at Dicle University Faculty of Medicine Hospital for at least 6 months, ii. Having received counseling from our psychosocial support clinic after the Kahramanmaraş Earthquake, iii. Being evaluated twice between the first 30 days and the second 30 days after the earthquake

Exclusion criteria from the study: i. Having been working at Dicle University Faculty of Medicine Hospital for less than 6 months, ii. Being evaluated outside the specified dates, iii. Been evaluated less than two times

Data from 102 healthcare professionals were included. All participants included in the study signed the informed consent form. The study was carried out following the Declaration of Helsinki Principles.

2.Data Collection Tools

The sociodemographic data and scales for evaluating ASD and PTSD of the participants were recorded by the clinicians in the hospital data recording system. The data of participants were examined retrospectively.

2.1.Sociodemographic Data Form: This form, which was prepared to record the sociodemographic characteristics of healthcare professionals applying to the psychosocial support clinic, includes information such as age, gender, marital status, and education information.

2.2.The National Stressful Events Survey Acute Stress Disorder Short Scale (NSESSS): This scale measures the severity of ASD symptoms in individuals over 18 years following a highly stressful event or experience. It has seven items which rate the severity of acute stress disorder during the past seven days on a 5-point (0=Not at all; 1=A little bit; 2=Moderately; 3=Quite a bit, and 4=Extremely) Likert scale. The total score can range from 0 to 28, and higher scores indicate greater severity. The scale was structured and published according to the ASD DSM-V diagnostic criteria by the American Psychiatric Association (APA), and its Turkish reliability and validity study was conducted by Aşçıbaşı et al. in 2017 (6). In the Turkish validity and reliability study, Cronbach's alpha coefficient for internal consistency was 0.95.

2.3.The National Stressful Events Survey Post-traumatic Stress Disorder Short Scale (NSESSS): This scale measures the severity of PTSD symptoms in individuals over 18 years following a highly stressful event or experience. It has nine items which rate the severity of acute stress disorder during the past seven days on a 5-point (0=Not at all; 1=A little bit; 2=Moderately; 3=Quite a bit, and 4=Extremely) Likert scale. The total score can range from 0 to 28, and higher scores indicate greater severity. The scale was structured and published according to the PTSD DSM-V diagnostic criteria by the APA, and its Turkish reliability and validity study was conducted by Evren et al. in 2016 with Cronbach's alpha of 0.87 (7).

3.Ethics Committee Permission

Since the study was designed retrospectively, academic review board permission was obtained from Dicle University Faculty of Medicine, Department of Psychiatry. Ethics committee permission for the study was received from Dicle University Medical Faculty Non-Interventional Clinical Research Ethics Committee (Date: 13.09.2023/Permission number: 240).

4.Statistical Methods

SPSS (Statistical Package for Social Sciences) 26.0 program was used to analyze the data. Frequencies, means, and standard deviations were calculated for descriptive statistics. The Kolmogorov-Smirnov test was used to determine whether the data were normally distributed. To compare two sample means, for normal distributed data Independent-T test and non-normal distributed data Mann-Whitney U test was used. Kruskal Wallis test was used to compare three sample means for non-normal distributed data, and Post Hoc test was used to identify which groups differ from each other. Simple linear regression analysis was used to examine the relationship between a dependent and an independent variable. P-value of <0.05 was taken for statistical significance.

Results

Participants' mean age was 32.70±8.26 years, and the mean education duration was 15.81±3.26 years. 52% of the participants were women, 49% were married, and 42.2% had a child/children. The rates of professions were distributed as follows: 38.2% physician, 35.3% nurse, and 26.5% other healthcare workers. While 25.5% had a history of psychiatric disorder, 17.6% had a family history of psychiatric disorder (Table 1).

Table 1. Sociodemographic characteristics and psychiatric disorder history of participants	
	X̄±SD
Age	32.70±8.26
Education duration (years)	15.81±3.26
	N (%)
Gender Female Male	53 (52) 49 (48)
Marital status Single Married	52 (51) 50 (49)
Having a child/children Yes No	43 (42.2) 59 (57.8)
Proffession Medical doctor Nurse Other healthcare workers	39 (38.2) 36 (35.3) 27 (26.5)
History of psychiatric disorder Yes No	26 (25.5) 76 (74.5)
Family history of psychiatric disorder Yes No	18 (17.6) 84 (82.4)
X̄; Mean, SD; Standart Deviation, N; Number, %; Percent	

Gender, marital status, and having a child/children did not significantly affect NSESSS-ASD scores. While NSESSS-PTSD mean scores were significantly higher in the participants who have a child/children than the ones who have not (p<.05), there were no statistical differences by gender and marital status (Table 2).

Table 2. Scale scores by sociodemographic characteristics				
Gender	Female (N=53)	Male (N=49)	Independent T-Test	
	X̄±SD	X̄±SD	t	p
NSESSS-ASD	12.00±6.94	9.78±5.99	1.727	.087
NSESSS-PTSD	12.58±8.85	12.49±7.72	.058	.954
Marital Status	Single (N=52)	Married (N=50)		
NSESSS-ASD	10.40±6.23	11.48±6.91	-.826	.411
NSESSS-PTSD	11.79±7.44	13.32±9.09	-.933	.353
Having a child/children	Yes (N=43)	No (N=59)		
NSESSS-ASD	11.98±7.23	10.17±5.98	1.379	.171
NSESSS-PTSD	14.65±9.27	11.00±7.18	2.154	.034*
X̄; Mean, SD; Standart Deviation, N; Number, NSESSS; The National Stressful Events Survey Short Scale, ASD; Acute Stress Disorder, PTSD; Post-traumatic Stress Disorder *; p< .05				

Nurses had significantly higher scores than physicians for both ASD and PTSD scales (p<.05), while there was no statistical difference between other binary comparisons (Table 3).

Table 3. Scale scores by profession						
Profession	Physician (N=39)	Nurse (N=36)	Other HW (N=27)	Kruskal Wallis test		Post hoc
	±SD	X̄±SD	X̄±SD	X 2	p	
NSESSS-ASD	8.31±4.91	13.61±6.63	11.15±7.26	11.565	.003**	2>1
NSESSS-PTSD	9.05±4.95	16.31±8.57	12.56±9.70	12.411	.002**	2>1
X̄; Mean, SD; Standart Deviation, N; Number, NSESSS; The National Stressful Events Survey Short Scale, ASD; Acute Stress Disorder, PTSD; Posttraumatic Stress Disorder, HW; Healhcare Worker**; p< .01						

Participants with history of psychiatric disorder had significantly higher scores than the ones with no history of psychiatric disorder for both scales (p<.05). Family history of psychiatric disorder did not significantly affect scale scores (Table 4).

Table 4. Scale scores by having history and family history of psychiatric disorder				
History of psychiatric disorder	Yes (N=26)	No (N=76)	Mann-Whitney U	
	X̄±SD	X̄±SD	U	p
NSESSS-ASD	13.85±6.71	9.93±6.25	659.000	.011*
NSESSS-PTSD	16.23±9.19	11.28±7.61	667.000	.014*
Family history of psychiatric disorder	Yes (N=18)	No (N=84)		
NSESSS-ASD	12.83±5.03	10.52±6.80	568.000	.098
NSESSS-PTSD	13.11±7.74	12.42±8.44	691.000	.568
X̄; Mean, SD; Standart Deviation, N; Number, NSESSS; The National Stressful Events Survey Short Scale, ASD; Acute Stress Disorder, PTSD; Post-traumatic Stress Disorder *; p< .05				

According to simple linear regression analysis, ASD score predicts PTSD score by 40.6% (R2=.406) (Table 5).

Table 5. Simple linear regression analysis results on the effect of NSESSS-ASD on NSESSS-PTSD						
Dependent variable	Independent variable	B	SE	Beta	t	Regression results
NSESSS-PTSD	NSESSS-ASD	.805	.097	.637	8.273	R=.637 R2=.406 F=68.447 p=<.001***
Durbin Watson: 1,612						
NSESSS; The National Stressful Events Survey Short Scale, ASD; Acute Stress Disorder, PTSD; Post-traumatic Stress Disorder						

Simple linear regression chart is given in Figure 1. The regression formula is "PTSD Score= 3.74+0.8 (ASD Score)".

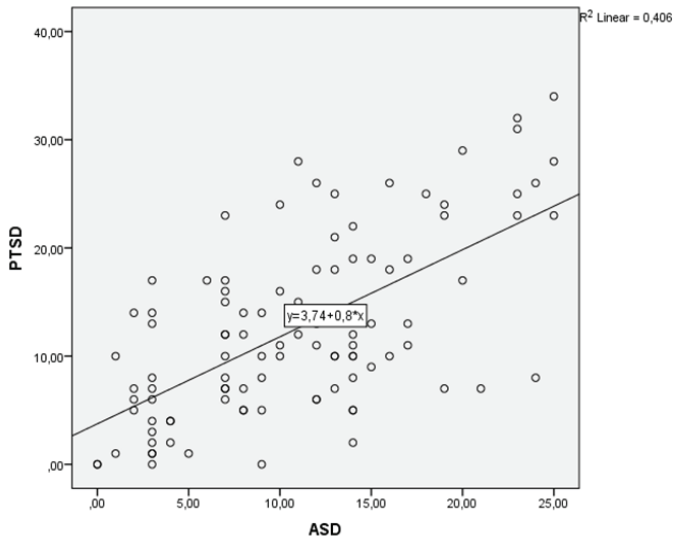

Figure 1. Simple linear regression chart of NSESSS-ASD's effect on NSESSS-PTSD

ASD; Acute Stress Disorder, PTSD; Post-traumatic Stress Disorder

Discussion

The main findings of our study were:

1.While having children was a factor that significantly increased the PTSD scale score, it did not significantly affect ASD scores. Additionally, scale scores were not significantly affected by gender and marital status.

2.Since healthcare workers were compared threefold as physicians, nurses, and others, both scale scores of nurses were found to be significantly higher than medical doctors.

3.While having history of psychiatric disorder significantly increased both ASD and PTSD scale scores, having family history of psychiatric disorder did not significantly affect either scale.

4.NSESSS ASD scores were predicting PTSD scores by regression formula of "PTSD Score= 3.74+0.8 (ASD Score)".

The fact that healthcare workers are a front-line professional group in disasters such as epidemics and earthquakes brings healthcare workers more face-to-face with psychological trauma (8, 9). For this reason, this particular group needs to be studied.

1.While having children was a factor that significantly increased the PTSD scale score, it did not significantly affect ASD scores. Additionally, scale scores were not significantly affected by gender and marital status.

A study conducted in the United States with emergency physicians showed no statistically significant difference between mean PTSD severity score by age, gender, marital status, and having children (10). It is noteworthy that there are not enough studies in the literature investigating the effect of having a child/children on PTSD. The magnitude of the earthquakes experienced, two consecutive main earthquakes, and thousands of aftershocks did not make it possible to create a safe living space for earthquake victims after the earthquake. Healthcare workers who had to be on duty had difficulty finding suitable places to leave their children, and they could not stop themselves from worrying about their children. For these reasons, the Kahramanmaraş earthquake may have had different effects than other traumas and even other earthquakes.

Previous studies showed that women have higher risk for PTSD than men. These studies indicate that their results may be related to greater fear conditioning in women (11, 12). In a large sample post-earthquake PTSD study conducted in Iran, it was stated that women had more PTSD than men in regions moderately affected by the earthquake. Still, such gender differences were not found in severely affected areas (13). Our non-significant result may be due to the severity of the earthquake.

In a study with 2004 sample after an earthquake in China, being unmarried/divorced/widowed was found to be an independent risk factor for PTSD (14). On the contrary, Guo J. et al. found that being married in the early period after the earthquake was significantly associated with PTSD (15). Being married may be a factor that causes higher anxiety in the early post-traumatic period and increases PTSD. It may turn into a protective factor in terms of social support in later periods after trauma. In a review of 46 articles, parallel to our result, it was found that marital status did not significantly affect the incidence of PTSD (16). How long after the trauma the study was conducted and the sample size may affect the results. Our results may have been affected by similar factors.

2.Since healthcare workers were compared threefold as physicians, nurses, and others, both scale scores of nurses were found to be significantly higher than physicians.

There is only one study about the comparison of PTSD between nurses and physicians after an earthquake. This study was conducted following an earthquake measuring 7.0 that occurred in Southern Taiwan in 2016 and resulted in 117 deaths and 513 people wounded disaster. In this study, nurses tended to have higher rates of PTSD than physicians, similar to our study (17).

In studies after pandemics and epidemics, nurses were found to be more at risk for PTSD than other healthcare professionals

and physicians. Some of these studies focused on positive coping styles of physicians associated with better outcomes (18, 19). Other authors stressed the effect of maladaptive coping styles in predicting PTSD (20).

In a study evaluating physicians and nurses in China, it was found that negative life events were associated with anxiety and depression, physicians experienced more work-related negative events than nurses, but nurses had higher anxiety and depression symptoms than physicians (11).

In a study conducted during the COVID-19 epidemic in Turkey, parallel to our study, nurses' NSESSS-ASD scale levels were significantly higher than physicians (21). This study commented that the NSESSS levels of nurses who are in contact with patients for a long time and provide primary care are significantly higher than physicians and other healthcare professionals, which is an expected and consistent finding with the literature (22, 23).

3.While having history of psychiatric disorder significantly increased both ASD and PTSD scale scores, having family history of psychiatric disorder did not significantly affect either scale.

In a review, it was mentioned that individuals who reported psychological adjustment problems before the trauma showed higher levels of PTSD symptoms than those who did not report psychological adjustment problems before the trauma (24). It has been suggested that the individual's pre-traumatic psychopathology also poses a risk for the development of PTSD (25). In this context, our results are parallel to the literature.

Evidence supporting the association between family psychiatric history and PTSD is inconsistent. Individual studies have shown that parents' mental health disorders are associated with an increased risk of PTSD. Maternal depression has also been shown to be associated with an increased risk of PTSD. Statistically significant associations between PTSD and family history of psychiatric depression, anxiety, and psychosis have also been reported (26). However, a meta-analysis including 77 studies investigating PTSD risk factors showed that the relationship between family psychiatric history and PTSD was not significant (27).

4.NSESSS-ASD score was a predictor of PTSD score.

Previous studies have shown that 57-83% of cases with ASD develop PTSD in the subsequent period and that ASD is a risk factor for PTSD. A study assessing the ability of ASD to predict PTSD found that the severity of ASD symptoms was associated with later PTSD symptoms in a sample who experienced the Lushan earthquake (4).

Having a longitudinal design is a strong aspect of our study. Unlike most previous reports addressing the long-term consequences of traumatic events, our study's early assessment of PTSD, ASD, and related risk factors can be mentioned as a strength of our research. However, the fact that the mental status evaluations of the people were not continued in the subsequent period is a limitation of the study. The small number of samples can also be considered a limitation of the study.

Conclusion

Having a child/children, being a nurse, and having a psychiatric history were found to be risk factors for developing PTSD in healthcare workers. Gender, marital status, and family history of psychiatric disorder did not statistically affect the development of PTSD. Higher NSESSS-ASD scores were predicting higher NSESSS-PTSD scores.

Risk groups for the development of PTSD in healthcare workers should be identified through studies with larger samples and more extended follow-up periods.

Protective measures should be taken for all healthcare workers and risk groups. The working conditions of healthcare workers should be improved. It should not be forgotten that healthcare professionals may also need support while helping other people.

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No person/organization financially supports the study, and the authors do not have any conflict of interest.

Declaration of Author Contribution

All authors contributed to the design of the study, collection, analysis or expression of data, designing the article, reviewing the scientific content, or approving the preprint version of the article.

References

1. AFAD, 2023. 06 Şubat 2023 Pazarcık-Elbistan (Kahramanmaraş) Mw:7.7 – Mw:7.6 Depremleri Raporu. Pp1-2. Retrieved [September 10, 2023], from https://deprem.afad.gov.tr/assets/pdf/Kahramanmara%C5%9F%20Depremi%20%20Raporu_02.06.2023.pdf
2. American Psychiatric Association. (2022). Diagnostic and statistical manual of mental disorders (5th ed., text rev.). https://doi.org/10.1176/appi.books.9780890425787
3. Tang B, Deng Q, Glik D, Dong J, Zhang L. A meta-analysis of risk factors for post-traumatic stress disorder (PTSD) in adults and children after earthquakes. Int J Environ Res Public Health. 2017;14(12):1537.

4. Zhou P, Zhang Y, Wei C, Liu Z, Hannak W. Acute stress disorder as a predictor of post-traumatic stress: A longitudinal study of C Chinese children exposed to the Lushan earthquake. PsyCh journal. 2016;5(3):206-14.
5. Bryant RAJBp. Early predictors of post-traumatic stress disorder. Biol Psychiatry. 2003 May 1;53(9):789-95
6. Ascibasi K, Cokmus FP, Aydemir O. Reliability and validity of Turkish form of severity of acute stress symptoms scale/ Dsm-5 Akut Stres Belirti Siddeti Olcegi Turkce Formunun Gecerliligi Ve Guvenilirligi. Anadolu Psikiyatri Derg. 2017;18(S2):38-45.
7. Evren C, Dalbudak E, Aydemir O, et al. Psychometric properties of the Turkish PTSD-Short Scale in a sample of undergraduate students. Klinik Psikofarmakol Bulteni. 2016;26(3):294-302.
8. d'Ettorre G, Ceccarelli G, Santinelli L, et al. Post-traumatic stress symptoms in healthcare workers dealing with the COVID-19 pandemic: a systematic review. Int J Environ Res Public Health. 2021;18(2):601.
9. Nishi D, Kawashima Y, Noguchi H, et al. Resilience, post-traumatic growth, and work engagement among health care professionals after the Great East Japan Earthquake: A 4-year prospective follow-up study. J Occup Health. 2016 Jul 22;58(4):347-53.
10. DeLucia JA, Bitter C, Fitzgerald J, Greenberg M, Dalwari P, Buchanan P. Prevalence of Post-Traumatic Stress Disorder in Emergency Physicians in the United States. West J Emerg Med. 2019 Aug 28;20(5):740-746.
11. Milanak ME, Zuromski KL, Cero I, Wilkerson AK, Resnick HS, Kilpatrick DG. Traumatic Event Exposure, Posttraumatic Stress Disorder, and Sleep Disturbances in a National Sample of U.S. Adults. J Trauma Stress. 2019 Feb;32(1):14-22.
12. Christiansen DM, Berke ET. Gender- and Sex-Based Contributors to Sex Differences in PTSD. Curr Psychiatry Rep. 2020 Mar 3;22(4):19.
13. Rafiey H, Alipour F, LeBeau R, Salimi Y. Prevalence and Determinants of PTSD 3 Years After an Earthquake in Iran. Community Ment Health J. 2019 Apr;55(3):542-547.
14. Kun P, Tong X, Liu Y, Pei X, Luo H. What are the determinants of post-traumatic stress disorder: age, gender, ethnicity or other? Evidence from 2008 Wenchuan earthquake. Public Health. 2013 Jul;127(7):644-52.
15. Guo J, Wu P, Tian D, et al. Post-traumatic stress disorder among adult survivors of the Wenchuan earthquake in China: a repeated cross-sectional study. J Anxiety Disord. 2014 Jan;28(1):75-82.
16. Dai W, Chen L, Lai Z, Li Y, Wang J, Liu A. The incidence of post-traumatic stress disorder among survivors after earthquakes: a systematic review and meta-analysis. BMC Psychiatry. 2016 Jun 7;16:188.
17. Ke YT, Chen HC, Lin CH, et al. Posttraumatic Psychiatric Disorders and Resilience in Healthcare Providers Following a Disastrous Earthquake: An Interventional Study in Taiwan. Biomed Res Int. 2017;2017:2981624.
18. Phua DH, Tang HK, Tham KY. Coping responses of emergency physicians and nurses to the 2003 severe acute respiratory syndrome outbreak. Acad Emerg Med. 2005 Apr;12(4):322-8.
19. Wu P, Fang Y, Guan Z, et al. The psychological impact of the SARS epidemic on hospital employees in China: exposure, risk perception, and altruistic acceptance of risk. Can J Psychiatry. 2009 May;54(5):302-11.
20. Maunder RG, Lancee WJ, Balderson KE, et al. Long-term psychological and occupational effects of providing hospital healthcare during SARS outbreak. Emerg Infect Dis. 2006 Dec;12(12):1924-32.
21. Hacimusalar Y, Kahve AC, Yasar AB, Aydin MS. Anxiety and hopelessness levels in COVID-19 pandemic: A comparative study of healthcare professionals and other community sample in Turkey. J Psychiatr Res. 2020 Oct;129:181-188.
22. Que J, Shi L, Deng J, et al. Psychological impact of the COVID-19 pandemic on healthcare workers: a cross-sectional study in China. Gen Psychiatr. 2020 Jun 14;33(3):e100259.
23. Zhang WR, Wang K, Yin L, et al. Mental Health and Psychosocial Problems of Medical Health Workers during the COVID-19 Epidemic in China. Psychother Psychosom. 2020;89(4):242-250.
24. Ozer EJ, Best SR, Lipsey TL, Weiss DS. Predictors of posttraumatic stress disorder and symptoms in adults: a meta-analysis. Psychol Bull. 2003 Jan;129(1):52-73.
25. Sayed S, Iacoviello BM, Charney DS. Risk factors for the development of psychopathology following trauma. Curr Psychiatry Rep. 2015 Aug;17(8):612.
26. Koenen KC, Moffitt TE, Poulton R, Martin J, Caspi A. Early childhood factors associated with the development of post-traumatic stress disorder: results from a longitudinal birth cohort. Psychol Med. 2007 Feb;37(2):181-92.
27. Brewin CR, Andrews B, Valentine JD. Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. J Consult Clin Psychol. 2000 Oct;68(5):748-66.