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Research Article

Frequency of Exposure to Traumatic Events and Routine Stressors, Coping Strategies and PTSD Symptoms on Emergency Nurses

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Abstract

Emergency nurses are exposed daily to numerous stressful situations that can lead to the development of post-traumatic stress disorder (PTSD) symptoms. This study examined the relationship between frequency of exposure to both traumatic events and routine stressors and PTSD symptoms as a function of coping strategy (reappraisal versus distraction). For this purpose, a sample of 147 emergency nurses from three hospitals in Madrid (Spain) completed the Traumatic Events and Routine Stressors in Emergency Nursing Scale (TRSS-EN), the Posttraumatic Diagnostic Scale (PDS-5) and the Thought Control Questionnaire (TCQ).

Results showed that distraction moderates the relationship between the frequency of traumatic events and the development of PTSD symptoms, in the sense that greater use of distraction would be linked to an increase in PTSD symptoms as the frequency of traumatic events increases. Furthermore, reappraisal was found to play no significant moderating role in the relationship between frequency of exposure to routine stressors and PTSD symptoms.

These findings suggest that while the content of traumatic events has a uniform character of highly shocking or threatening elements, routine stressors contain elements that may involve a high variability in their threatening value. Thus, for routine stressors the ability to choose reappraisal or distraction depending on the perceived intensity will be decisive. Some preventive measures are suggested according to the results of the study.

Keywords: Coping Strategies; Distraction; Emergency Nursing; Mental Health and Illness; Post-Traumatic Stress Disorder; Reappraisal; Routine Stressors; Traumatic Stressors.

Introduction

Several studies have shown the high incidence of PTSD symptoms in emergency nurses [1, 2]. In this regard, a study by Gates et al [3] in the United States (2011) indicated that the majority of hospital emergency staff (94% of staff) reported PTSD symptoms after exposure to a violent event. In the same vein, Iranmanesh et al [4] in Iran (2013) found that 94% of emergency nurses experienced PTSD symptoms.

This high incidence of PTSD symptoms is considered a direct consequence of the numerous highly threatening stressful situations to which the nursing professional is exposed [1, 3, 5]. A frequently used classification of stressors distinguishes between traumatic events and routine stressors [6, 7, 8]. Traumatic events refer to shocking, frightening or dangerous experiences that may

affect someone emotionally and/or physically [1], involving death, threat of death, serious personal injury or sexual violence [9]. On the other hand, routine stressors refer to other, in principle less significant, but more frequent sources of stress. However, some of these routine stressors seem to be related to the presence of certain symptomatological manifestations of traumatic character [7, 10]. For this type of stressors that occur in a traumatic environment, several studies highlight the importance of environmental factors that surround them and the relevance of the perceived uncontrollability and unpredictability of these stressors as essential aspects in their relationship with such symptoms [8, 11, 12]. In this sense, attention has been drawn to the necessary existence of a truly traumatic context (such as that experienced daily by emergency service professionals) that offers necessary conditions for the pathological action of routine stressor to occur [8, 13, 14]. Thus, both aspects (environment and uncontrollability-unpredictability), acting in combination, could be capable of generating a highly threatening routine context, possibly greater than that resulting from mere exposure to traumatic events. Therefore, the experience of traumatic events, connatural in emergency nursing setting, could be perceived as relatively controllable and predictable by these professionals, as they are trained and prepared to deal with them adequately [13].

In general terms, when a situation is assessed as threatening, the occurrence of stress manifestations will depend mainly on the effectiveness of actions or strategies that are implemented to cope with the threat [15, 16]. Numerous studies have focused on the importance of intensity and frequency from events to explain why certain strategies are more functional than others. Thus, with regard to emotional intensity of a situation, several authors differentiate between strategies of emotional engagement and strategies of emotional disengagement [17, 18]. In this sense, researchers' attention has focused on distraction as a form of disengagement, as it allows attention to be diverted from the emotional situation; and on reappraisal as a connection option, as it implies attending to stressful situation by reinterpreting its negativity in a positive way [19].

It is assumed that in routine situations or situations of moderate emotional intensity, both reappraisal or distraction can reduce discomfort, but only reappraisal allows emotional processing, which is essential for long-term adaptation in order to favour a process of habituation, which is something that will occur when the frequency of this type of stressor increases [20, 21, 22]. Therefore, in the case of routine stressors associated with trauma, reappraisal should be better strategy when the frequency of occurrence of these stressors increases. Conversely, in traumatic or emotionally intense situations, distraction is likely to be better able to reduce distress by blocking the processing of emotional information [17, 19, 23], thus allowing short-term relief [21] and preventing progression to sensitization. Consequently, the use of distraction will be functional to the extent that traumatic events have a low frequency of occurrence, especially in professions where there is a cognitive framework justifying such experiences. However, this strategy will lose its protective capacity as such events are repeated more frequently, given the difficulty of repeatedly ignoring events of high emotional intensity, so that, instead of a process of habituation, a process of sensitization will be activated, as typically occurs with repeated exposure to high-intensity stimuli.

The aim of the present study was to test the differential moderating capacity of distraction and reappraisal on the relationship between frequency of exposure to traumatic events and routine stressors associated with trauma and the presence of PTSD symptoms. To this end, the following hypotheses were proposed: H1) the use of distraction will moderate the relationship between frequency of exposure to traumatic events and PTSD symptoms. Greater use of distraction will be linked to an increase in PTSD symptoms when frequency of traumatic events increases, and H2) the use of reappraisal will moderate the relationship between frequency of exposure to routine stressors and PTSD symptoms. Greater use of reappraisal will be linked to a decrease in PTSD symptomatology when frequency of routine stressors increases.

Methods and Materials

Participants and Procedure

The sample consisted of 147 emergency nurses (128 women and 19 men), working in three hospitals in Madrid (Spain), and aged between 24 and 61 years. The mean age of respondents was 40.41 (SD = 8.32), and they had been working in the same department for a mean of 9.9 years (SD = 6.69). In total, 111 participants spent more than 75% of their working time in direct contact with their patients (Table 1 presents a detailed description of the sample). As general inclusion criteria, participants were required to have worked in the same emergency department for at least one year. General exclusion criteria were: significant acute or chronic medical or psychiatric disorders [9].

Table 1: Basic descriptors of study participants as a function of their demographic and professional characteristics.

Descriptive data	**Mean**	**SD**	**n**	**Percentage**
Age (N = 144)	40.41	8.32		
Children (N = 147)	0.99	1.02		
Years of experience in the profession (N = 147)	16.48	7.33		
Years of experience in the same job (N = 147)	9.90	6.69		
Characteristics				
Gender			**147**	**100**
Male			19	12.9
Female			128	87.1
Relationship status			**145**	**100**
In a stable relationship			115	79.3
Single			30	20.7
Educational level			**146**	**100**
DUE			88	60.3
General Nurse			11	7.5
TCAE			43	29.5
Others			4	2.7
Employment situation			**147**	**100**
Permanent			72	49
Non-permanent			75	51
Percentage with patients			**146**	**100**
Less than 25%			8	5.5
From 25% to 50%			2	1.4
From 50% to 75%			25	17.1
More than 75%			111	76

Note: Children refers to the number of children of the participants. DUE (Diplomado Universitario de Enfermería) is equivalent to general nurse; TCAE (Técnico en Cuidados Auxiliares de Enfermería) is equivalent to nursing assistant; Others (different category to the main qualification required).

Before collecting data, the authors contacted several hospitals to explain the study and request their collaboration. This study was conducted in accordance with the Declaration of Helsinki [24]. The study protocol was approved by the research ethics committee of the University Rey Juan Carlos (number 030320162116).

For each hospital, we applied a simple random sampling between the whole of nursing workers from the three hospitals. We assumed a confidence level of 95% and a level of heterogeneity of 50%. This sample size was enough to detect, in multiple regression models with a total number of three predictors and one tested predictor (interaction term), a medium effect size ($f2 = 0.15$) with a target power of 0.99, following Cohen's guidelines for small, medium, and large effects [25]. A total of 218 nursing professionals were initially involved. Thirteen participants were excluded on the application of inclusion criteria, and 68 did not return complete questionnaires (response rate = 71.7%). The study proceeded over 16 months, from February 2017 until June 2018, during which researchers were

in contact with participants. Initially, brief meetings were held in which the researchs aims were presented and inclusion criteria discussed. All participants who voluntarily agreed to participate provided signed informed consent and were instructed on how to complete the questionnaire items, which were administered via the Internet. Participants were given a month to return the instruments, during which a reminder was sent by email. Data were initially collected using Google Drive. The evaluation session lasted about 20 min. In all instances, participant anonymity was preserved by means of the use of codes.

Instruments

Traumatic Events and Routine Stressors in Emergency Nursing Scale (TRSS-EN)

The Traumatic and Routine Stressors Scale on Emergency Nurses (TRSS-EN) [26], is a 13-item measure that was used to simultaneously assess frequency (frequency of expo-sure) and severity (emotional impact) to common traumatic events and routine stressors associated with trauma in the daily work of emergency nurses during the previous six months. Frequency of exposure is indicated on a 7-point Likert scale, where 1 is "fewer than three times in six months" and 7 is "every day" (Frequency scale), and emotional impact of the stressful event is indicated using a second 7-point Likert scale, where 1 is "without emotional impact" and 7 is "maximum emotional impact" (Impact scale). The final scale provides six indexes: "Emotional Impact of traumatic stressors", "Emotional Impact of routine stressors", "Frequency of traumatic stressors", "Frequency of routine stressors", "Total Impact of traumatic stressors", and "Total Impact of routine stressors".

The Psychometric Properties of TRSS-EN show a factorial solution with two factors for the impact scale in TRSS-EN. The eigenvalues for these factors were >1: 6.79 for the first and 1.57 for the second factor. The communality values ranged from 4.64 to 7.59. According to these criteria, the factorial solution was composed of two factors. The first comprised the following items: 1 "Dealing with sudden death of young people", 2 "Dealing with death or resuscitation of a baby or young child", 3 "Handling victims of car and train crashes",4 "Confrontation with physical trauma and burn patients", 5 "Dealing with suicide", 10"Confrontation with child abuse and negligence" and 11 "Exposure to sudden death", with factorial weights between 0.682 and 0.846. This factor, labeled "Traumatic stressors", was made up of traumatic events and stressors of great magnitude. Cronbach's alpha for this factor was 0.911 and Omega index was 0.857. The second factor was composed of items 6"Dealing with aggression, violence and threat", 7 "Inability to deliver good quality of care",8 "Inability to help chronically ill patients", 9 "Dealing with relatives of victims/patients,12 "Dealing with psychiatric patients", and 13 "Management of dead bodies", with factorial weights between 0.562 and 0.819. This second factor was called "Routine stressors" and comprised events and stressors of moderate magnitude. Cronbach's alpha for this factor was 0.862 and Omega index was 0.833. Each factor (traumatic stressors and routine stressors) has 3 indexes (impact, frequency and total impact), in total six indexes. The scale has high internal consistency (Cronbach's Alpha = 0.92), adequate test–retest reliability and satisfactory concurrent validity [26].

Thought control questionnaire (TCQ)

The Thought Control Questionnaire [27] is a 30-item self-report questionnaire of the strategies people use to control unwanted or unpleasant thoughts. These strategies are: distraction, social control, worry, punishment, and reappraisal, which are rated on a 4-point Likert scale, where 1 is "never" and 4 is "almost always". The scale shows good internal consistency, with the following Cronbach's alphas for the subscales: (distraction = 0.72, social control = 0.79, worry = 0.71, punishment = 0.64 and reappraisal = 0.67). In addition, it shows adequate test-retest reliability (r = 0.83) and adequate convergent and discriminant validity of all the scales [28].

Posttraumatic Diagnostic Scale for DMS-5 (PDS-5)

The Posttraumatic Diagnostic Scale for DMS-5 (PDS-5) [29] is a 24-item measure that assesses the severity of PTSD symptoms experienced in the past month, according to DSM-5 criteria. We used the Spanish version of the post-traumatic diagnosis scale for DSM-5. For this purpose, we used the Spanish version of the DSM-5 manual [23]. The PDS-5 consists of four subscales: "Intrusion" (5 items), "avoidance" (2 items), "changes in mood and cognition" (7 items) and "arousal, arousal and hyperarousal" (6 items). All these items are rated on a 5-point Likert scale ranging from (0) "not at all" to (4) "6 or more times a week/severe". Four additional items ask about distress and interference caused, as well as onset and duration of symptoms. A high score on the PDS-5 represents a high level of psychiatric symptoms. Cronbach's alpha = 0.92, test-retest reliability (r = 0.90). Convergent validity was deemed good [29].

Analyses

Preliminary zero-order correlations were initially calculated between the study variables (frequency of traumatic events and routine stressors factors from TRSS-EN scale, reappraisal and distraction strategies from TCQ scale and PTSD symptom subscales from PDS-5 test). Next, using Student's t-test for related measures, we tested statistically significant differences between levels of intensity of emotions elicited by traumatic events and intensity generated by routine stressors in the sample, as well as differences between frequency of exposure to traumatic events and frequency of exposure to routine stressors. Subsequently, in order to test the first and second hypotheses, a series of moderated

multiple regression analyses [30] (Baron and Kenny 1986) were conducted to determine whether reappraisal and distraction differentially moderated the relationship between frequency of stressors (traumatic and routine) and development of PTSD symptoms as a function of the severity and periodicity of the stressors. For the moderated multiple regression analyses, Hayes' Process v2. 16.3 macro [31] (2013) was used, employing bootstrapping technique (10000 bootstrap) for the calculation of confidence intervals (Model 1; for use of this macro, see Hayes, [32] (2009)) and with conditioning options: pick a point and Johnson-Neyman. Frequency of traumatic and routine stressors served as the independent variable, reappraisal and distraction strategies were moderating variables, and PTSD symptoms were considered as dependent variables. The following procedure was used: each of the two frequency sub-indices of the TRSS-EN scale, together with reappraisal/distraction strategies and the five scales of the PDS-5 were entered separately. A total of 20 potential moderation effects (10 for reappraisal and 10 for distraction) were tested in this way. Statistical tests were carried out in a two-tailed format. All reported results were considered significant at the $p<0.05$ level. The analysis of the study data was performed using the statistical software IBM SPSS Statistics for Windows, version 25.0 (IBM, Armonk, NY, USA).

Results

Associations between frequency of traumatic events and routine stressors, reappraisal and distraction strategies and PTSD symptoms

Basic descriptive and zero-order correlations between sub-indices of frequency of traumatic events and routine stressors of the TRSS-EN scale, reappraisal/distraction strategies and PTSD symptoms are presented in Table 2. Reappraisal correlated positively with both intrusive and avoidant PTSD symptoms ($r = 0.199$ and $r = 0.222$, respectively). Results of the Student's t-test for related samples showed the existence of statistically significant differences between level of emotional intensity elicited by traumatic events and emotional intensity elicited by routine stressors ($t = 7.70$, $p<0.05$; I. C [0.54, 0.91]), additionally also showed the existence of statistically significant differences between frequency of exposure to traumatic events and frequency of exposure to routine stressors ($t = -18.73$; $p<0.05$; I.C [-1.98, -1.60]). No significant correlations of distraction with any of the study variables were observed. There were also no significant correlations between indicators of exposure frequency and such symptoms.

Table 2: Means, standard desviations and bivariate correlations between emotional impact and frequency indices of the TRSS-EN scale, reappraisal and distraction and PTSD symptoms (PDS-5).

	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Emotional impact of TE (TRSS-EN)	4.56	1.44										
2. Emotional impact of RS (TRSS-EN)	3.84	1.23	0.643**									
3. TE frequency (TRSS-EN)	1.98	0.84	0.004	0.252**								
4. RE frequency (TRSS-EN)	3.76	1.34	0.140	0.380**	0.513**							
5. Reappraisal (TCQ)	2.35	0.56	0.036	0.080	0.110	0.159						
6. Distraction (TCQ)	2.60	0.60	0.299**	0.302**	0.132	0.132	0.132					
7. Global PTSD Index (PDS-5)	12.77	13.40	0.134	0.307**	0.084	0.098	0.190	0.123				
8. Intrusion (PDS-5)	3.58	3.68	0.084	0.272**	0.123	0.057	0.199*	0.136	0.863**			
9. Avoidance (PDS-5)	1.52	1.68	0.187	0.313**	0.048	0.097	0.222*	0.181	0.810**	0.743**		
10.Cognition (PDS-5)	3.62	4.76	0.042	0.234*	0.072	0.128	0.143	0.078	0.924**	0.678**	0.671**	
11.Arousal (PDS-5)	4.04	4.78	0.204*	0.308**	0.053	0.068	0.158	0.099	0.934**	0.713**	0.680**	0.835**

Note**:** **Note:** TE = Traumatic events; RS= Routine stressors. < 0.01; *p< 0.05. **p

Moderating role of reappraisal and distraction on the relationship between frequency of exposure to traumatic events versus routine stressors and PTSD symptoms

The results of moderate multiple regression analyses (Table 3) showed the existence of a significant positive moderating effect of the distraction on the relationship between frequency of severe traumatic events and intrusive symptoms of PTSD.

Table 3: Summary of results of moderate multiple regression analyses of reappraisal and distraction as moderators in the relationship between frequency of exposure to traumatic events and routine stressors and PTSD symptoms (general index and scales, PDS-5).

	PDS-5	**Intrusion**	**Avoidance**	**Cognition**	**Arousal**
Reappraisal					
TE Frequency	-3.82	-0.07	-0.46	-1.14	-1.52
RS Frequency	-2.63	-0.74	-0.30	-0.84	-0.74
Distraction					
TE Frequency	1.29	1.15*	-0.01	-0.22	0.26
RS Frequency	0.54	0.57	-0.07	-0.40	0.33
Note: TE = Traumatic events; RS= Routine stressors. Beta not standardized. **p< 0.01; *p < 0.05.					

More specifically, Table 4 shows the three linear regression models taking the PTSD intrusion subscale as dependent variable, distraction as moderator, and frequency of traumatic events as independent variable. In this sense, the positive interaction effect between frequency of traumatic events and distraction was statistically significant (B = 1.15, p < 0.05, SE = 0.54, [0.08, 2.23]), and the model as a whole explained 7.27% of the total variance of the dependent variable (0.0727), with the interaction effect only explaining 4.32% of the variance (change in R2 = 0.0432). Also, results of the pick-a-point technique showed that the conditional effect of the moderator occurred among nurses with high levels of distraction (B = 1.03, p < 0.05, SE = 0.48, [0.07, 1.98]) and not for those with low (B = -0.42, p > 0.05, SE = 0.55, [-1.51, 0.67]) or medium (B = 0.30, p > 0.05, SE = 0.39, [-0.47, 1.07]) levels of distraction. In addition, the Johnson-Neyman technique indicated the value 3.08 as the cut-off point at which the use of distraction became significant, with 20.79% of the sample above this value.

Table 4: Results of the moderate multiple regression analyses for the prediction of PTSD symptoms. Only significant moderate effects are presented.

	B	SE	t	R^2 cor.
Intrusion (PDS-5)				
Distraction	-1,82	1,32	-1,38	
TE frequency	-2,68	1,50	-1,78	
Distraction x TE frequency	1,15	0,54	2,13*	0,04*
Note: TE = Traumatic Events; B = Beta not standardized. **p <0.01; *p<0.05.				

There was no significant moderating effect of reappraisal on the relationship between frequency of events (traumatic and routine stressors) and development of PTSD symptoms. The interaction effects discussed in Table 4 can also be seen in Figure 1.

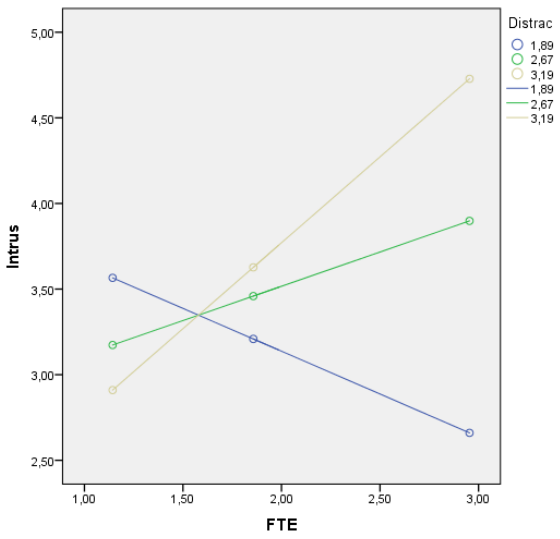

Figure 1: Graphical representation of the moderating effect of distraction (Distrac) on the relationship between frequency of exposure to traumatic events (FTE) and intrusive PTSD symptoms (Intrus).

Discussion

The results obtained in the present study support the first hypothesis which indicated that, in emergency nurses, distraction could moderate the relationship between frequency of exposure to traumatic events and the development of PTSD symptoms. In this sense, we have observed that greater use of distraction could be linked to an increase in these symptoms when frequency of traumatic events increases. In other words, when traumatic events become more common due to their increased frequency, the continued use of distraction as strategy would cease to be adaptive. These findings are in the same direction as those found in other studies [20, 21] which observed that, although a stressor with low frequency of exposure is better regulated with strategies such as distraction, as it allows short-term relief, with more frequent stimuli it is not as effective. Therefore, while strategies such as distraction would be more adaptive in the short term, other types of strategies would be more appropriate in the long term [20, 21, 22].

Given the existence of a cognitive justification context in nursing profession for such experiences, while distraction may initially attenuate effects of the emotional impact of low frequency traumatic events [21], when daily exposure to traumatic events becomes more and more frequent, the use of distraction may pose a barrier to habituation. In other words, disengagement strategies might be functional under low rates of occurrence of traumatic events, but in the face of an uncontrolled increase in traumatic events they might, under the conditional presence of the aforementioned justification framework, be an impediment to achieving habituation.

Regarding the second hypothesis, the results obtained suggest that reappraisal does not play a significant moderating role in the relationship between frequency of exposure to routine stressors associated with trauma and PTSD symptoms. In this sense, it was not observed that greater use of reappraisal was linked to a decrease in PTSD symptoms when frequency of routine stressors increased. It is important to note that while content of traumatic events has a uniform character, and refers to direct and passive exposure to highly shocking or threatening elements (most of them referring to death), routine stressors contemplate elements of personal management that could involve high intrapersonal and interpersonal variability in terms of their threatening value. Depending on the ability and training of each nurse, as well as the justification that they give to each stressor, these stressors will end up being more or less threatening. Thus, for routine stressors associated with trauma, the ability to choose reappraisal or distraction according to the perceived intensity will be decisive. Thus, an evolution towards a model of choice flexibility [17, 19] is necessary to properly understand coping with routine stressors using paradigms such as the one employed by Levy-Gigi et al. [19] (2015) but differentiating between types of stressors (traumatic versus routine).

Limitations

Some limitations of the present study should be mentioned. First, given the cross-sectional nature of this study, it is important to be cautious in interpreting the meaning of the relationships found. Reappraisal and distraction are considered to be ways of dealing with unpleasant private experiences, as well as the contexts that cause them [27], but frequency of their use may eventually increase as a consequence of the repeated exposure to traumatic events to which emergency nurses are exposed. Longitudinal studies are essential to examine predictive values of each variable and the specific direction of influence over time. Secondly, considering the special characteristics of this population (emergency nurses), repeatedly exposed to traumatic events of differing emotional magnitude in their work environment, on a daily basis, it is possible that PDS-5 [29] cannot fully cover the complete spectrum of post-traumatic implications characteristic of the nursing profession. In this sense, variables such as habituation and sensitization to traumatic events or psychological burden of repeated exposure to traumatic events are not common characteristics in the general population. In the absence of a specific questionnaire that could record PTSD symptoms in this particular group of professionals, general tools were used, which could be responsible for the limited moderating effect of distraction on this type of symptomatology. It might be interesting to explore this issue further in future research. Third, although in the present research PTSD symptoms has been conveniently measured with test based on the Diagnostic

and Statistical Manual of Mental Disorders [9], it is well known that the assessment is not only focused on the diagnosis of PTSD, but also on its associated symptoms, some of which may not be truly defining of the disorder itself. Finally, although this study is a good representation of the real distribution of women and men about emergency nursing in Spain, results should preferably be generalized to women. Future studies should expand this research to the male population.

Conclusions

The results of the present study highlight the need to take into consideration the frequency of exposure to stressors in order to adequately understand the effectiveness of the different coping strategies used in emergency nursing setting. Following the results obtained in this research, a preventive approach (Emotional Regulation Training) could be designed to help to emergency nurses to identify and use the most appropriate coping strategies according to the characteristics and frequency of each situation. In this sense, the use of distraction could be limited to highly emotional situations, not dependent on active action by the individual and cognitively justified as an essential part of the job. Training programmes for development of tools and skills and application of training programmes in exposure, acceptance and conflict management could also be developed and implemented within the scope of cognitive-behavioural training. All these preventive measures could significantly reduce PTSD related symptomatology associated with repeated exposure to both traumatic events and routine stressors in emergency nursing practice.

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