

Traumatic Stress in Emergency Medical Technicians: Protective Role of Age and Education



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SUMMARY

Objective: Some professions carry a higher risk of being traumatized; health care workers, especially those working at emergency services, are at higher risk in this respect. This study aims to examine the psychological effects of different types of work-related traumatic events on emergency medical technicians (EMTs) and the possible protective effects of factors such as age, education, and experience.

Method: The targeted population was all EMTs working at emergency wards and first-aid stations within the province of Niğde. Consenting subjects were given self-report questionnaires concerning traumatic stress and work-related traumatic events. 135 EMTs (90 female, 45 male) with complete data sets were included in the study.

Results: The subjects reported experiencing an average of 6.8 types of different work-related traumas. Those who were older and with higher education reported higher numbers of event types. Traumatic stress levels were predicted by higher number of reported work-related trauma types. When analyzed separately within age and education groups, the number of work-related traumatic events predicted traumatic stress among younger subjects and those with lower education; no such prediction was observed among older or more educated subjects.

Conclusion: Findings suggest that lower education and younger age independently predict negative psychological effects of work-related traumatic events. These findings may lead to changes in how emergency health care is organized in Turkey.

Keywords: emergency medicine, education, PTSD

INTRODUCTION

Psychological traumas are defined as extraordinary events involving serious threat of death or serious injury to the individual that are either experienced by or witnessed by the individual or heard to happen to loved ones (APA 2014). Apart from physical consequences, psychological traumas cause several psychological problems including anxiety, depression symptoms, suicide, or posttraumatic stress disorder (PTSD) (Breslau et al. 1991, Kessler et al. 1995, Kiliç 2004). Types of traumas that lead to PTSD include accidents and disasters, in addition to man-made traumas such as assault, rape, and torture. PTSD is common after psychological trauma and may last for many years in some people (Kessler et al. 1995, Kidson et al. 1993, Schnurr et al. 2000). PTSD prevalence has been

shown to be around 3% in epidemiologic studies conducted in 13 countries (Stein et al. 2014). Along with depression, PTSD is listed among disorders that cause the most severe disability (Kessler 2000, Kiliç 2004, Alonso et al. 2004).

There is a higher risk of being traumatized in some professions; health professionals, those working at emergency services and first aid staff are at especially high risk. Emergency medical technicians (EMTs) have to provide essential health care in non-optimal circumstances, may have to make life and death decisions, and are often faced with accidents, severe injuries, fatalities, violence and homicide as part of their routine practice; in addition, they are subjected to violence directed towards them. Posttraumatic stress symptoms, burnout, anxiety, and depressive symptoms are commonly observed (Ayrancı et al.

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2002, Sterud et al. 2006, Gökçe and Dündar 2008, McAllister and McKinnon 2009, Annagür 2010, Scully 2011).

Psychological problems are more prevalent among EMTs than among the police force or firefighters, who are exposed to similar tasks (Berger et al. 2012). Studies showing lower job satisfaction and higher burnout among EMTs (Whealin et al. 2007, Popa et al. 2010, Gökçen et al. 2013) are indicative of the stressfulness of practicing emergency medicine. Most of the health care workers employed at emergency services or ambulances in Turkey are emergency medical technicians (EMTs) with high school level education. There are also paramedics with a university level education employed in the same setting. High school and college graduates may undertake similar levels of responsibility, which lead to occasional conflicts (Çınar and Kavlak 2009). In both the European Union and in North America, health education starts at the age of 18, which is formulated within the European Union as “after a basic training of 10 years”. Current practice in Turkey requires the employment of many young and inexperienced people in emergency services. It is not fully understood how stressful working conditions affect the individual, or what types of qualities one should have to be prepared to deal with the stress. Still, it is reasonable to assume that starting a job that involves the risk of severe traumatic event exposure at a very young age may have serious negative effects on psychological health. Education and experience, on the other hand, are known to decrease the negative effects of repeated traumatic events (Dougallet al 2000). Studies conducted among EMTs show that younger subjects have higher traumatic stress symptoms than older subjects (Laposa et al. 2003, Jonsson et al. 2003, Bennet et al. 2005, Berger et al. 2012). Although there are studies showing high rates of anxiety, depression and traumatic stress (Dürü et al. 2006, Yılmaz 2007, Çınar and Kavlak 2009, Çakmak et al. 2010, Tokuç et al. 2011), no study has yet examined the effects of age, education, or work experience on traumatic stress levels of EMTs in Turkey. The present study examines the effects of different types of work-related traumatic events on EMTs, and also the possible protective roles of age, education, and experience.

METHODS

This is a cross-sectional study designed to measure the levels and predictors (especially age, education, and work experience) of traumatic stress due to work-related traumatic events among EMTs in Turkey.

Sample

The targeted sample was EMTs working at first aid stations or emergency wards in Nigde province. Around 250 EMTs working in Nigde were visited at their workplaces, briefed about the study, and were invited to participate. Out of 176 people reached in this manner, 20 declined to participate

(stating they were too busy), 6 stated they had administrative jobs and did not encounter traumatic cases, which left 150 people who filled out the questionnaires. Fifteen were excluded due to missing data. The final sample therefore comprised of 135 cases (response rate of 77%). Ninety respondents (66.7%) were female, and 45 (33.3%) were male. The mean age of the sample was 25.0 (sd:4.8). Altogether, 117 people (86.3%) were EMTs and the remaining 18 (13.7%) were paramedics or nurses.

Measures

Sociodemographics Form was developed by the researchers for this study. Guided by the relevant literature, we included sociodemographic items that could be important in the assessment of traumatic stress symptoms. This form also includes an 11-item “EMT Occupational Trauma Questionnaire,” also developed by the researchers, and assesses 11 work-related traumatic events. Participants are asked if they experienced any one of the 11 events at their workplace in the previous year, and the frequency of the event. The frequency variable was not included in the analysis due to the high rate of missing data. Number of work-related event types was summed up to yield a total score of experienced trauma types. The fact that the number of event types significantly correlates with the total number of events experienced (data not reported), suggests that this variable can be used as a trauma severity variable. Other variables included in the analyses were: sex, age (25 or younger, 26+), education (high school, university), marital status (not married, married), and work experience (years). Since the subject group was not homogenous in terms of age and education, categorical, (instead of continuous) variables were preferred (i.e. age: 26 years and older vs lower; education: high school vs. university).

Traumatic Stress Symptom Checklist (TSSC, Başoğlu et al 2001). This is a 23-item, self-rated questionnaire that inquires about current traumatic stress and depression on a 4 point scale. The first 17 items assess the presence of PTSD items; the last six items assess depression. Internal consistency (alpha) was .94 for the total scale, .92 for the first 17 items, and .84 for the six depression items. We used the total score of the 17-item version in our analyses.

Procedure

Necessary permissions for conducting research at the health stations were obtained from the local authorities. The subjects were also briefed on the study and provided consent in writing. The questionnaires took approximately 20-30 minutes to complete and were administered at the subjects’ workplaces, either in a meeting room or in a resting room of the units. The assessment took place between May-August 2013. The study was approved by the ethical board of Nigde University.

RESULTS

Table 1 shows the breakdown of basic demographic information of our 135 participants by gender. We examined 11 different types of work-related traumatic events. The average number of event types experienced by the subjects was 6.8 (sd:2.8). There was no difference in terms of types of events reported by women (6.7, sd: 3.8) or by men (7.2, sd: 3.0). There was no single event type that differentiated women from men. Older subjects (26 or older) tended to report more types of events than younger ones (7.2 vs. 6.4). The types of events experienced were significantly higher among university graduates (8.0, sd:2.7) than in high school graduates (6.2, sd:2.6). University graduates experienced more of almost any type event compared to high school graduates.

Table 1. Demographic characteristics of the sample by gender

Characteristics	Male (N=45) Mean (SD)	Female (N=90) Mean (SD)	Total (N=135) Mean (SD)
Work experience (years)	5.1 (4.3)	4.8 (3.7)	4.9 (3.9)
Age	24.9 (5.4)	25.1 (4.4)	25.0 (4.8)
Work-related traumatic events	7.2 (3.0)	6.7 (3.0)	6.8 (2.8)
	Frequency (%)	Frequency (%)	Frequency (%)
University graduates	17 (37.8)	32 (35.6)	49 (36.3)
Married	17 (37.8)	43 (47.8)	60 (44.4)

SD: standard deviation

Table 2. Traumatic Stress Symptom Checklist (TSSC) Score of Distribution by Sex, Age Group and Education

	TSSC Score	t, p
Sex		
Female (N=90)	14.9 (11.0)	
Male (N=45)	11.3 (10.5)	1.9, .062
Education		
High school (N=86)	12.5 (11.0)	
University (N=49)	15.7 (10.7)	1.63, .1
Age		
Below 26 years (N=68)	12.1 (10.6)	
26 years and older (N=67)	15.3 (11.2)	1.74, .09

The divergence of the correlation within age and educational groups are shown in Graph 1a and 1b.

Several different factors may be responsible for the traumatic stress levels EMTs report, therefore we performed regression analyses to determine independent predictors. Independent variables included in the predictors were: sex (1=male, 2=female), age group (1=25 or younger, 2=26+), education (1=high school, 2=university), marital status (1=not married, 2=married), work experience (years), and number of work-related event types (0-11). Regression analyses revealed a single variable predicting TSSC total score: work-related event type.

Table 3. Predictors of Traumatic Stress Symptom Checklist (TSSC) Score in all cases; and within Sex, Age and Education Sub-groups

Predictors Variables	All cases	Sex		Age Group		Education	
		Male	Female	Below 26 years	26 years and older	High school	University
Sex	.16a	-	-	.21a	.12	.04	.29a
Education	.03	-.27	.12	-.02	.05	-	-
Marital status	.09	.25	.10	-.09	.21	.17	-.08
Age	.02	.15	-.01	-	-	.07	-.11
Work experience (years)	.05	-.02	.05	.07	-.01	-.07	.39
Work-related traumatic events	.19*	.20	.21a	.34**	.05	.34**	-.05

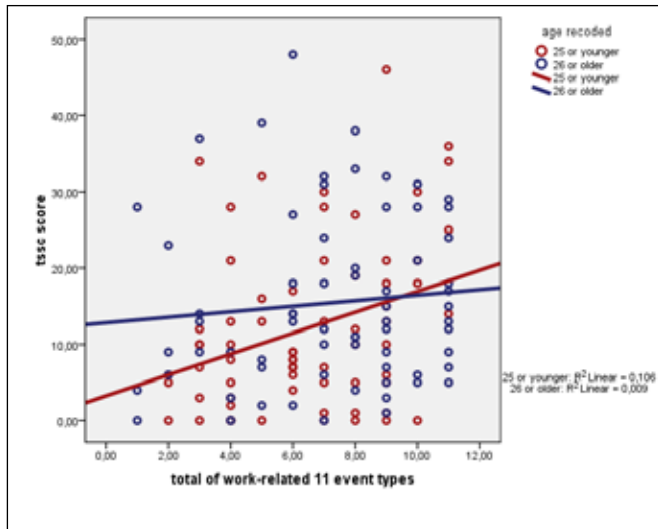
*trend, * <.05, ** <.01

DISCUSSION

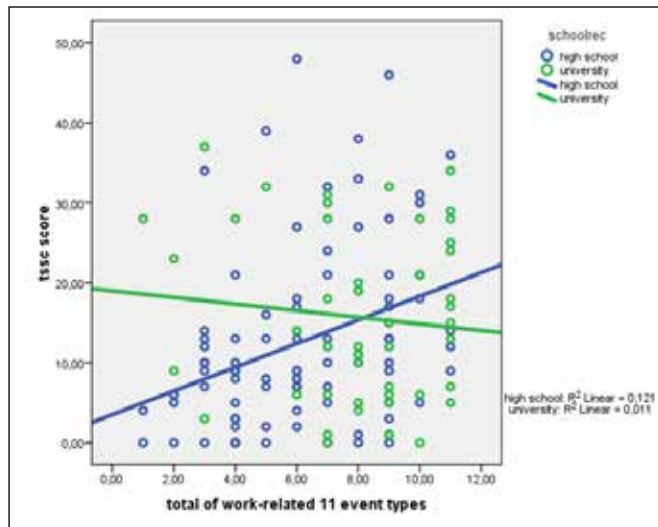
Emergency health care workers experience several and serious traumatic events. These events both decrease their motivation and also lead to psychological problems. We examined the prevalence of work-related traumatic events and their predictors among EMTs working at health stations and emergency units. Our findings show that traumatic stress, a condition known to be chronic and which causes significant disability, is predicted most strongly by the number of work-related traumatic event types. This finding is in line with the literature on the psychological effects of traumatic events. That the increase in the severity of stressor parallels the increases both in the prevalence and severity of psychological symptoms is well known (Kılıç 2004, Karam et al. 2014).

More detailed analyses revealed interesting and novel findings of our study: the positive relationship between traumatic stress and event type was observed among the younger and the less educated subjects. In other words, the moderate relationship we found in the total group was caused by a (comparatively stronger) relationship in younger age and lower education groups. Since these findings were reached through regression analyses, they were independent of the effects of other study variables. For example, the relationship between TSSC total score and event type observed among the younger subjects was independent of their education level or gender. Similarly, the relationship between TSSC total score and event type observed among lower education group was independent of the subjects' gender or age. These findings show that when all other variables are kept constant, EMTs who are younger or who have lower education are at higher risk of being negatively affected by work-related traumatic events. Our results show, although indirectly, the possible protective role of work experience against traumatic stress. The fact that the prediction of traumatic stress by work experience did not reach significance was probably simply due to its high correlation with age. Although younger age and lower education has been shown to relate to traumatic stress in the literature (Özgen and Aydın 1999, Kılıç 2004, Aker et al. 2008, Bulut 2009, Berger et al. 2012), older age and more work experience have also been shown to relate to negative outcomes, possibly due to a higher chance of experiencing traumatic events (Jonsson et al. 2003, Bennett et al. 2005). We can conclude that stressful events encountered as part of an emergency care profession have a more negative effect on younger, less educated, and less experienced workers. Alternatively, we can say that, being older, having higher education, or more work experience are protective against the negative effects of these events.

Our results provide important input for those responsible for the organization of health care services. The fact that younger and less educated staff are at higher risk means that both their psychological health and also the quality of services are



Graph 1 a. Correlation between Traumatic Stress Symptom Checklist (TSSC) score and work-related traumatic events (within educational groups)



Graph 1 b. Correlation between Traumatic Stress Symptom Checklist (TSSC) score and work-related traumatic events (within age groups)

Those who reported experiencing a higher number of event types also had higher traumatic stress. Although not significant, women tended to report more traumatic stress than men. Education, age, or work experience (years at work) did not predict TSSC (Table 3).

In order to test our hypothesis on the effect of age and education, we repeated the regression analyses separately within gender, age and education groups (Table 3). Within women, there was a trend for a positive correlation between event type and TSSC. There were significant differences for age and education groups: within high school graduates and within younger subjects (25 or younger), event type predicted TSSC; no such correlation was observed within university graduates or older subjects. Within-group correlations showed a similar pattern (Graph 1a & b).

negatively affected. Risk reduction for these staff should include regulatory changes regarding the age and educational level requirement of EMTs.

There are several limitations of our study. Psychological assessment was done using questionnaires; we can therefore can talk about symptom levels, not diagnoses. Second, data collection was cross-sectional; self-reported information was collected on the effects of past events on the subjects' current psychological status. Due to the cross-sectional design, we cannot be certain if other variables present at the time of data collection are responsible for our results, neither can we say if the symptoms will change in time. Trauma severity was measured by the number of different types of work-related events; this variable may not be sufficient to reflect the severity of trauma. Not including the assessment of subjective reaction to the trauma (i.e. fear) is another limitation. Similarly, number of years at work may not accurately reflect work experience. Our sample cannot be considered to represent the whole universe of EMTs. Participants' personal and psychological profiles, as well as the types of events they experienced, therefore, may show differences from other health care workers in the country. Studies conducted in several centers with differing characteristics and using larger samples may decrease these limitations.

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