

THE DANGERS OF DETRIMENTAL COPING IN EMERGENCY MEDICAL SERVICES

Mark Holland, PhD, EMT-P

ABSTRACT

Background. To manage the untoward effects of exposure to personally disturbing incidents (PDIs), fire/emergency medical services (EMS) professionals use a variety of coping methods. Some detrimental coping patterns have been steeped in the tradition of emergency services. **Objective.** To examine the effectiveness of various coping methods utilized by fire/EMS professionals for mitigating the negative effects of exposure to PDIs. **Methods.** To differentiate a relationship between the demographic data, traumatic stress, exposure to personally disturbing incidents, and coping methods of fire/EMS professionals, three questionnaires were utilized: a background/demographic questionnaire (BDQ), the 28-item General Health Questionnaire (GHQ-28), and the Ways of Coping Questionnaire (WOC). Descriptive and correlational analyses were used to evaluate the level of traumatic stress symptomatology associated with personally disturbing incidents and describe the relationship between the psychological health of fire/EMS professionals and coping methods. **Results.** One hundred eighty fire/EMS professionals were surveyed. This study identified the subjective stress associated with five PDIs and pinpointed five detrimental coping methods of fire/EMS personnel that were predictors for increasing traumatic stress symptomatology. **Conclusion.** A significant relationship has been established between the dangers of detrimental coping methods and traumatic stress in fire/EMS professionals. Five detrimental coping methods have been correlated with traumatic stress. Three optimal coping methods offer promise in managing the untoward effects of PDIs. **Key words:** EMS; detrimental coping; traumatic stress; personally disturbing incidents; coping strategies; mental health; psychological factors

PREHOSPITAL EMERGENCY CARE 2011;15:331-337

INTRODUCTION

Firefighters and emergency medical services (EMS) professionals must cope with a variety of job-related stressors. One significant stressor for fire/EMS providers involves exposure to personally disturbing incidents (PDIs). A *personally disturbing incident*, or

critical incident, is defined as an event that is sufficiently disturbing to overwhelm or threaten to overwhelm the individual's normal coping methods.¹ Various studies have examined the psychological effects of exposure to critical incidents. Findings vary from non-harmful outcomes to the full development of posttraumatic stress disorder (PTSD).²⁻⁴ Posttraumatic stress disorder or traumatic stress symptoms include 1) intrusive memories; 2) avoidance, withdrawal; and 3) unrelenting physiologic stress arousal symptoms for more than 30 days.⁵

In the past two decades, research in this area has shifted from merely considering the victims who experienced critical incidents to include an examination of the stress experienced by those who have provided assistance to the victims. Researchers have investigated the detrimental impact on mental health professionals and emergency services professionals who have provided professional psychological and medical care for victims.⁶ Researchers concluded that the level of PTSD experienced by professionals caring for victims of critical incidents frequently exceeded the level found in the general public and closely resembled the level of PTSD found in the victims of critical incidents.⁷

Other studies have indicated a variety of additional negative outcomes related to fire/EMS professionals' exposure to critical incidents. Two negative outcomes identified were high rates of dissociation and interpersonal relationship difficulties.^{8,9} However, not all fire/EMS providers exposed to critical incidents develop dissociation, PTSD, or relational difficulties. It seems safe to assume that certain protective factors shield some professional caregivers from the harmful effects of exposure to critical incidents.¹⁰ Preliminary research regarding coping methods utilized by fire/EMS professionals has determined that a number of factors influence resiliency. Two coping methods used by fire/EMS providers, repressive coping and suppression, have reportedly functioned as protective factors and may be responsible for individuals' resiliency following exposure to a critical incident.^{11,12} However, repressive coping and suppressing feelings following exposure to a critical incident have also shown a significant positive correlation with psychological problems.^{13,14} Although the literature seems to portray contradictory data on what coping methods are helpful after exposure to a critical incident, there seems to be unanimity on the need to research coping methods that show promise for mitigating traumatic stress symptomatology associated with exposure to critical incidents.

Received July 22, 2010, from the Parkwood Fire Department, Durham, North Carolina; and the Center for Counseling and Family Studies, Liberty University, Lynchburg, Virginia. Revision received September 24, 2010; accepted for publication November 4, 2010.

The author reports no conflicts of interest. The author alone is responsible for the content and writing of the paper.

Address correspondence and reprint requests to: Dr. Mark Holland, Parkwood Fire/EMS, 1409 Seaton Road, Durham, NC 27713. e-mail: wmholland@liberty.edu

doi: 10.3109/10903127.2011.561406

Coping methods that reduce PTSD symptomatology are necessary for fire/EMS professionals because these providers cope daily with extraordinary and unrelenting stress. These work-related stressors are further accentuated by the requirements that fire/EMS providers must deliver competent, appropriate, and multifaceted lifesaving interventions. Fire/EMS professionals must cope with a variety of job-related stressors, including critical incidents. Managing subjective stress to maintain decision-making capacity in perilous situations remains a matter of grave concern for fire/EMS professionals and the public they serve.

To manage the untoward effects of traumatic stress after exposure to PDIs, fire/EMS professionals use a variety of coping methods. The purpose of this study was to investigate the level of traumatic stress symptomatology in fire/EMS professionals working in an urban multitiered North Carolina fire/EMS system. Additionally, this study sought to identify coping styles utilized by fire/EMS providers that demonstrated effectiveness for the mitigation of the traumatic stress symptomatology associated particularly with exposure to PDIs.

This study examined coping styles utilized by fire/EMS providers and sought to identify coping methods that prove effective in mitigating the traumatic stress symptomatology that follows exposure to critical incidents. The study hypothesized the following:

1. There would be a significant relationship between the subjective level of distress of fire/EMS professionals involved with PDIs and their level of traumatic stress symptomatology.
2. There would be a significant relationship between the demographic data and the traumatic stress symptomatology of fire/EMS professionals.
3. There would be a significant relationship between the traumatic stress symptomatology of fire/EMS professionals and their choice of coping methods even after controlling for the effect of exposure to PDIs.

Identifying coping methods that benefit fire/EMS providers who are consistently exposed to critical incidents or PDIs offers enormous outcomes. Some anticipatory benefits of these findings include improving the psychological health of fire/EMS providers, decreasing the potential for burnout, and enhancing occupational satisfaction. The benefits have great meaning for the fire/EMS providers, their families and the communities they serve.

METHODS

Design

The Liberty University Institutional Review Board approved this study. A convenience sample of the first 183 subjects attending a normally scheduled continuing medical education session were recruited from more than 500 career and volunteer fire/EMS professionals from the Durham County EMS System in Durham, North Carolina. These subjects were invited to participate in an anonymous survey. The sample included fire/EMS providers who served in their agency as a first responder to medical emergency calls and EMS providers whose primary responsibilities were providing emergency medical care by treating and transferring patients to local medical centers.

The primary investigator acquired administrative support and written approval of the county EMS director and each fire department's administration for the research project. Sixty days before the systemwide administration of the survey, a pilot study was conducted with a small sample within the fire/EMS system to ensure that the survey was functional, subjects could navigate the survey layout, and the questions were clearly stated.

At the initial session with the participants, the investigator distributed the two consent forms and the survey. The investigator conducted a 10-minute introduction to the study, discussing the two consent forms and providing instructions for completing the surveys. The surveys included a background/demographic questionnaire (BDQ), the 28-item General Health Questionnaire (GHQ-28), and the Ways of Coping Questionnaire (WOC).

The participants completed the survey in a group training session at the time of the overview. A confidential subject identification number was distributed to each fire/EMS provider during the survey session. The confidential subject identification number identified the participant's department affiliation only (county fire/EMS, county EMS, or city fire/EMS). This could be used in future research for subset analysis. The approximate time to complete the survey was 20 minutes. When the data analysis was completed, the principal investigator returned to each agency/department and provided a multimedia presentation of the results of the study.

Instruments

The BDQ was used to collect information related to age, gender, years of EMS career experience, credential status (paramedic, emergency medical technician [EMT], firefighter/EMT, firefighter), characteristics of the most distressing critical incidents encountered in

the preceding six months, the consequences of regular exposure to critical incidents, and the value of support, coping methods, training, and equipment available in the EMS system.

To measure the subjective distress associated with PDIs, seven PDIs, previously identified in research,¹⁵ were listed in the BDQ. The fire/EMS professional used a ratio scale to indicate the PDI as “least stressful” to “most stressful.” The seven PDIs were death of a child; providing urgent care to a patient who is a relative/close friend/colleague; victims of a natural disaster; accident calls/patients (e.g., vehicle collisions, plane crashes, industrial or work-related incidents); crime victims (e.g., victims of shootings, rape, child sexual abuse/assault); burn victims; and patients with massive traumatic injuries (e.g., massive bleeding and dismemberment).

To determine the level of traumatic stress symptomatology, traumatic stress symptomatology was measured by using the GHQ-28.¹⁶ The GHQ-28 has four subscales: Somatic Symptoms, Anxiety and Insomnia, Social Dysfunction, and Severe Depression. The GHQ-28 yields a single score with threshold scores of 4 or 5 indicating probable traumatic stress disorder.

To examine coping methods that may mitigate traumatic stress symptomatology, the WOC¹⁷ was used. The WOC is rooted in cognitive–phenomenologic theories of stress and coping. The WOC yields eight scales for coping styles: 1) Confrontive Coping; 2) Distancing; 3) Self-Controlling; 4) Social Support; 5) Accepting Responsibility; 6) Escape–Avoidance; 7) Problem Solving; and 8) Positive Reappraisal. The highest score for one of the eight coping methods would yield the primary coping method of the fire/EMS professional.

Data Analyses

Descriptive and correlational analysis was used to examine the relationship between the psychological health of fire/EMS professionals and their use of different coping methods. To examine the relationship between the subjective level of distress of fire/EMS professionals involved with PDIs and their level of traumatic stress symptomatology, a measure of the fire/EMS professional’s subjective level of distress was calculated by adding and averaging his or her total score from the PDI self-report section in the BDQ. The independent variable was the subjective level of distress of fire/EMS professionals involved with PDIs. The dependent variable was traumatic stress symptomatology. To determine a parametric correlation between subjective levels of distress and traumatic stress symptomatology, the Pearson correlation procedure was used to locate the significant results.

To determine nonparametric and parametric correlations between specific demographic data and trau-

matic stress symptomatology, a Pearson correlation procedure and a Spearman’s rho procedure were performed to determine the significant effects. The independent variables were age, gender, ethnicity, marital status, current position, and years of experience. The dependent variable was traumatic stress symptomatology.

A final data analysis would determine the relationship between the traumatic stress symptomatology of fire/EMS professionals and their choice of coping method even after controlling for the effect of the exposure to PDI. The independent variable was coping method. The control variable was the total distress variable. The *total distress* variable was created by totaling and averaging each fire/EMS professional’s subjective PDI distress level from the BDQ. The dependent variable was traumatic stress symptomatology. To predict which coping methods mitigate traumatic stress symptomatology in fire/EMS professionals, a linear regression procedure was performed to discover significant outcomes. To predict the odds of traumatic stress symptomatology related to specific coping methods, a logistic regression procedure was performed to determine the significant outcomes.

RESULTS

A total of 183 surveys from fire/EMS professionals in an urban fire/EMS system participated in this study. Three of the 183 surveys distributed were returned incomplete and were not used in the data analysis. Thus, the actual sample size was 180 subjects, representing a return rate of 98%.

Sixty-three (35%) of the participants reported serving in the position as firefighter/EMT, 51 (28%) EMT-paramedic, 25 (14%) firefighter/EMT-intermediate, 17 (9%) EMT, 15 (8%) EMT-intermediate, and nine (5%) firefighter/EMT-paramedic. The total number of years in emergency services ranged from six months to 39 years (mean = 13.29 years, standard deviation [SD] = 8.51 years). Seventy-two (40%) were between the ages of 30 and 39 years, 54 (30%) were between the ages of 40 and 49 years, and 34 (19%) were between the ages of 18 and 29 years.

One hundred seven (60%) fire/EMS professionals reported that the more often they had to deal with PDIs, the better they coped with them. Eight (4%) indicated that they coped “less well” after exposure to a PDI. Forty-five (25%) reported no effect on their coping method utilized after exposure to a PDI. Twenty (11%) subjects indicated that it was “more difficult” to deal with PDIs after exposure. The duration of distress following a PDI was reported as follows: a few hours ($n = 40$; 22%), about one day ($n = 16$; 9%), a few days ($n = 34$; 19%), about one week ($n = 14$; 8%), a few weeks ($n = 9$; 5%), about one month ($n = 6$; 3%), a few months ($n = 6$; 3%), and longer ($n = 11$; 6%).

For the total sample of 180 respondents, the mean score of traumatic stress on the GHQ-28 was 3.34 and the SD was 4.60. The fire/EMS providers who had reported experiencing a PDI in the preceding six months had a mean GHQ-28 score of 3.62 (SD = 4.86), in contrast to a mean GHQ-28 score of 2.48 (SD = 3.61) for those who had not experienced a PDI. A t-test revealed no significant difference between fire/EMS providers who experienced a PDI and those who did not experience a PDI.

“Caseness for traumatic stress disorders” on the GHQ-28 was recorded in 52 subjects (29%). *Caseness for traumatic stress* is defined as self-reported symptoms of traumatic stress inclusive of somatic symptoms, anxiety, insomnia, social dysfunction, and severe depression. Of the total sample, the paramedics reported the highest mean GHQ-28 score, 5.41 (SD = 5.69). The firefighter/EMTs reported the lowest mean GHQ-28 score, 2.10 (SD = 4.48). A t-test analysis for this difference showed significance ($t = 3.9, p < 0.01$).

There was a significant relationship between the subjective levels of distress of fire/EMS professionals across five of the seven PDIs and the level of traumatic stress symptomatology. A Pearson correlation analysis revealed a significant relationship between the levels of subjective distress from PDI exposures and the level of traumatic stress symptomatology. These PDIs included “death of a child” ($r = 0.16, p = 0.03$), “care of family/friend” ($r = 0.22, p = 0.00$), “care of disaster patients” ($r = 0.24, p = 0.00$), “victims of crime” ($r = 0.23, p = 0.00$), and “burn victims” ($r = 0.16, p = 0.03$) (Table 1). There was no significant relationship between the levels of subjective distress from two PDIs designated as exposure to “accident patients” and “massive traumatic injury victims” and the level of traumatic stress symptomatology.

Spearman rho analyses were used to associate the demographic data with the traumatic stress symptomatology of fire/EMS providers. Results indicated that age ($r_s = 0.015, p = 0.844$), gender ($r_s = -0.124, p = 0.098$), ethnicity ($r_s = 0.079, p = 0.295$), marital status ($r_s = 0.046, p = 0.536$), and position ($r_s = -0.098, p = 0.192$) were not correlated to the traumatic stress symptomatology of fire/EMS professionals.

Pearson correlation analysis was performed with the years of experience and traumatic stress symptomatology of fire/EMS professionals. The results indicate that number of years of experience was not correlated to the traumatic stress symptomatology ($r = 0.114, p = 0.128$).

The third hypothesis stated that there would be a significant relationship between the traumatic stress symptomatology of fire/EMS professionals and their choice of coping methods even after controlling for the effect of exposure to PDIs. To predict which coping methods mitigate traumatic stress symptomatology in fire/EMS professionals, a linear regression procedure was performed to discover significant outcomes.

Pearson correlation analysis revealed significant relationships at 0.01 levels between the following coping methods measured by the WOC and the traumatic stress symptomatology: escape/avoidance ($r = 0.48, p = 0.00$), accepting responsibility ($r = 0.38, p = 0.00$), confrontive coping ($r = 0.30, p = 0.00$), self-control ($r = 0.29, p = 0.00$), and distancing ($r = 0.20, p = 0.00$). The Pearson correlation between positive reappraisal, problem solving, and social support and the traumatic stress symptomatology measured by the GHQ-28 was not significant.

Linear regression analysis revealed that the following coping methods were significant predictors of increasing traumatic stress symptomatology: escape/avoidance ($\beta = 0.45, p = 0.00$), accepting responsibility ($\beta = 0.35, p = 0.00$), confrontive coping ($\beta = 0.25, p = 0.00$), self-control ($\beta = 0.24, p = 0.00$), and distancing ($\beta = 0.16, p = 0.03$). Linear regression analysis revealed that the coping method positive reappraisal mitigated traumatic stress symptomatology. However, the relationship was weak and statistically nonsignificant ($\beta = -0.10; p = 0.16$). These results are shown in Table 2.

To predict the odds of traumatic stress symptomatology related to specific coping methods, a logistic regression procedure was performed to discover the significant probabilities. Table 3 shows the odds ratio for the escape/avoidance coping method coefficient is 18.85 with a 95% confidence interval of 4.34–81.86. This suggests that fire/EMS professionals who utilize escape/avoidance coping methods are almost 19 times more likely to experience traumatic stress than those who utilize other methods as their primary coping method. Those who used confrontive coping (4.4%; $n = 8$) were 10 times more likely to suffer traumatic stress in comparison with those who used other primary methods of coping. The fire/EMS providers who used self-control coping methods (26.1%; $n = 47$) were three times more likely to experience traumatic stress symptoms than those using other coping methods.

DISCUSSION

There is a significant relationship between the subjective levels of distress of fire/EMS professionals and the different types of PDIs with which they are confronted. The level of traumatic stress symptomatology was correlated with five PDIs. Five PDIs were identified as significant variables leading toward traumatic stress symptomatology: death of a child, care of family/friend, care of disaster victims, care of crime victims, and care of burn victims.

Overall, this finding suggests that a strategy for decreasing the potential for traumatic stress symptomatology is identifying the level of subjective distress of fire/EMS providers related to detrimental

TABLE 1. Subjective Level of Distress in Fire/Emergency Medical Services Professionals and Self-Reported Traumatic Stress Symptomatology

		Death of a Child	Care of Family/Friend	Care of Disaster Patients	Accident Patients	Victims of Crime	Burn Victims	Massive Traumatic Injury Victims
GHQ-28 score	Pearson correlation (r)	0.16*	0.22†	0.24†	0.10	0.23†	0.16†	0.10
	Significance (p)	0.03	0.00	0.00	0.17	0.00	0.03	0.17
	(two-tailed) N	180	180	180	180	180	180	180

*Correlation is significant at the 0.05 level (two-tailed).
 †Correlation is significant at the 0.01 level (two-tailed).
 GHQ-28 = 28-item General Health Questionnaire.

TABLE 2. Linear Regression Analysis: The Relationship between Coping Methods of Fire/Emergency Medical Services Professionals and Traumatic Stress Symptomatology

Coping Method	Unstandardized Coefficients		Standardized Coefficients		Significance (p)	R ²
	B	Standard Error	β	t		
Problem solving	0.048	0.089	0.040	0.541	0.59	0.06
Confrontive coping	0.311	0.091	0.251	3.411	0.00	0.12
Social support	0.056	0.094	0.045	0.596	0.52	0.06
Accepting responsibility	0.563	0.115	0.345	4.901	0.00	0.17
Self-control	0.234	0.071	0.243	3.293	0.00	0.11
Escape/avoidance	0.427	0.064	0.448	6.624	0.00	0.24
Distancing	0.200	0.089	0.164	2.243	0.03	0.08
Positive reappraisal	-0.103	0.073	-0.104	-1.416	0.16	0.07

PDI. Fire/EMS providers are interested in learning about their subjective levels of distress related to PDIs; however, opportunities to learn this information are nonexistent. Assisting fire/EMS professionals in understanding their personal subjective levels of distress and identifying their perceived detrimental PDIs are paramount to these professionals' psychological survival.

One method to assist fire/EMS professionals in understanding their subjective distress is to administer a personal survey that includes a BDQ, the GHQ-28, and the WOC. The individual written report of the BDQ, GHQ-28, and WOC survey results can provide

a "snapshot" to each fire/EMS professional identifying his or her subjective distress associated with PDIs. The survey results can be returned to the individual and a group psychoeducational session can be offered to discuss the results of the survey and to assist the fire/EMS providers in identifying their subjective distress related to PDIs, determine their level of traumatic stress symptoms, and distinguish optimal and detrimental coping styles.

This study demonstrated that the potential for traumatic stress symptomatology after exposure to a PDI cannot be differentiated based on age, gender, ethnicity, marital status, position, or years of experience.

TABLE 3. Logistic Regression: The Relationship between Coping Methods of Fire/Emergency Medical Services Professionals and Traumatic Stress Symptomatology

Coping Method	B	SE	Wald	df	Sig. (p)	Exp(B) (OR)	95% CI for Exp(B)	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
No coping method reported	-0.807	1.145	0.497	1	0.481	0.446	0.047	4.210
Problem solving	0.303	0.641	0.223	1	0.637	1.353	0.385	4.752
Confrontive coping	2.269	0.876	6.703	1	0.010	9.667	1.735	53.845
Social support	0.777	0.832	0.871	1	0.351	2.175	0.426	11.116
Self-control	1.190	0.572	4.334	1	0.037	3.287	1.072	10.075
Escape/avoidance	2.937	0.749	15.360	1	0.000	18.850	4.340	81.864
Distancing	-0.640	1.151	0.309	1	0.578	0.527	0.055	5.035
Constant	-1.758	0.484	13.178	1	0.000	0.172		

CI = confidence interval; df = degrees of freedom; Exp = exponentiated; OR = odds ratio; SE = standard deviation; Sig. = significance.

Prehosp Emerg Care Downloaded from informahealthcare.com by 166.94.6.47 on 01/02/13 For personal use only.

Demographic factors do not offer protection against the psychological trauma related to constant exposure to PDIs.

Five coping methods were significantly correlated to traumatic stress. These detrimental coping methods were escape/avoidance, distancing, confrontive coping, accepting responsibility, and self-control. Escape/avoidance coping utilizes wishful cognitions and behavioral approaches to escape from or avoid the problem. Distancing coping uses cognitive strategies to detach from and diminish the significance of the situation. Confrontive coping employs aggressive tactics to modify the situation and indicates some degree of hostility and risk taking. Accepting responsibility coping recognizing one's own responsibility in the situation while simultaneously trying to put things right. Self-control coping uses feelings and actions to normalize one's emotions and behaviors.

The results of this study demonstrated that when detrimental coping methods were utilized, fire/EMS providers experienced more traumatic stress symptomatology. Escape/avoidance, distancing, and confrontive coping methods are steeped in a traditional philosophy within emergency services that fire/EMS providers are hardy individuals with "tough skins" and "nothing is supposed to bother them." However, fire/EMS professionals are human and have emotions. Exposing the dangers of the escape/avoidance, distancing, and confrontive coping is vital to challenging the harmful traditional philosophy within emergency services.

Potentially optimal coping methods identified in this study include social support, problem solving, and positive reappraisal. Social support coping utilizes resources that offer support through information gathering, physical presence, and psychological support. Problem solving coping uses purposeful problem-focused behaviors to address the situation, coupled with an analytic approach to solving problems. Positive reappraisal coping employs the creation of optimism to focus on personal growth and growth in spirituality.

LIMITATIONS

The current study focused on the use of coping methods to mitigate the traumatic stress symptomatology in fire/EMS professionals within an urban fire/EMS system, thus limiting the generalizability of the results. The demographic composition of the fire/EMS personnel of the urban fire/EMS system may be entirely different from that of other areas, particularly rural fire/EMS systems.

The instruments used in this study also have limitations in their design in general and their use in this specific study. As with all self-report assessments, the WOC and the GHQ-28 are limited in that they

are subject to forgetfulness or misrepresentation. The fire/EMS providers who completed the questionnaires did so voluntarily and thus constituted a self-selected group.

Based on this sample, it would seem that urban fire/EMS professionals and agencies would benefit from evaluating the psychological health and effective coping methods of their providers. Potential results of replicated studies investigating the psychological health of providers may lead to improving psychological health, decreasing burnout and enhancing occupation satisfaction.

A second implication for practice is assessing fire/EMS professionals regarding detrimental coping methods to counter traumatic stress symptomatology. Prior to an exposure to a PDI, a baseline assessment could be established for each fire/EMS provider to determine his or her psychological health and primary coping methods utilized. More research, with other fire/EMS agencies comparing coping methods and psychological health baselines, would be helpful in revealing the detrimental coping methods of fire/EMS professionals.

The results in this study are preliminary steps in understanding the psychological health and coping methods of fire/EMS professionals. More research is needed to establish the baseline for psychological health and validate the optimal coping methods of fire/EMS providers.

CONCLUSIONS

A significant relationship has been established between the dangers of detrimental coping methods and traumatic stress in fire/EMS professionals. Five detrimental coping methods have been correlated with traumatic stress. Three optimal coping methods offer promise in managing the untoward effects of PDIs.

References

1. Mitchell JT, Bray G. *Emergency Services Stress: Guidelines for Preserving the Health and Careers of Emergency Services Personnel*. Englewood Cliffs, NJ: Prentice Hall, 1990.
2. Freedy JR, Shaw DL, Jarrell MP. Towards an understanding of the psychological impact of natural disasters: an application of the conservation resources of stress model. *J Trauma Stress*. 1992;5:441-54.
3. McFarlane AC, Papay P. Multiple diagnosis of posttraumatic stress disorder in victims of natural disaster. *J Nerv Ment Dis*. 1992;180:498-504.
4. Regehr C, Goldberg G, Glancy G, Knott T. Posttraumatic symptoms and disability in paramedics. *Can J Psychiatry*. 2002;47:953-8.
5. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition. Washington, DC: APA, 2000.
6. Follette VM, Polusny MM, Milbeck K. Mental health and law enforcement professionals: trauma history, psychological

- symptoms, and impact of providing services to sexual abuse survivors. *Prof Psychol Res Pract*. 1994;25:275–82.
7. Carlier I, Lamberts RD, Gersons BP. Risk factors for post-traumatic stress symptomatology in police officers: a prospective analysis. *J Nerv Ment Dis*. 1997;185:498–506.
 8. Hodgins GA, Creamer M, Bell R. Risk factors for posttrauma reactions in police officers: a longitudinal study. *J Nerv Ment Dis*. 2001;189:541–7.
 9. McFarlane AC, Bookless C. The effect of PTSD on interpersonal relationships: issues for emergency service workers. *Sex Relationship Ther*. 2001;16:261–7.
 10. Ashikyan Z. Post-traumatic stress symptoms and coping styles of emergency department physicians [unpublished doctoral dissertation]. Los Angeles, CA: Alliant International University, 2005.
 11. Bonanno GA. Loss, trauma, and human resilience: have we understood the human capacity to thrive after extremely aversive events? *Am Psychol*. 2004;59:20–8.
 12. Bonanno GA, Noll JG, Putnam FW, O'Neill M, Trickett P. Predicting the willingness to disclose childhood sexual abuse from measures of repressive coping and dissociative tendencies. *Child Maltreat*. 2003;8:302–18.
 13. McFarlane AC. The aetiology of post-traumatic stress disorders following a natural disaster. *Br J Psychiatry*. 1988;152:116–21.
 14. Brown J, Mulhern G, Joseph S. Incident-related stressor, locus of control, coping, and, psychological distress among fire-fighters in Northern Ireland. *J Trauma Stress*. 2002;15:161–8.
 15. Alexander DA, Klein S. Ambulance personnel and critical incidents. *Br J Psychiatry*. 2001;178:76–81.
 16. Goldberg D, Hillier VF. A scaled version of the General Health Questionnaire. *Psychol Med*. 1979;9:139–45.
 17. Folkman S, Lazarus RS. *Manual for the Ways of Coping Questionnaire*. Palo Alto, CA: Consulting Psychologists Press, 1988.