



POST TRAUMATIC STRESS DISORDER (PTSD) IN EMERGENCY RESPONDERS SCOPING STUDY: ANNOTATED BIBLIOGRAPHY

by:

Barbara D. Adams, Samantha A. Davis, Andrea Brown, Emily-Ana Filardo
and Michael H. Thomson

HumanSystems® Incorporated
111 Farquhar Street
Guelph, ON N1H 3N4

Project Manager:

Barbara D. Adams
(519) 836-5911, Extension 249

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Abstract

This report aims to inform the emergency responder community about Post Traumatic Stress Disorder (PTSD). Given that the available literature within the emergency responder community is very limited, this review relies on the military and scientific literature to explore the issue of traumatic stress and PTSD. This review focused on the following four questions:

- How should PTSD be defined, recognized and how often does it occur?
- How can traumatic stress and PTSD be prevented?
- How should traumatic stress and PTSD be treated?
- What research could support management of PTSD in the emergency responder community?

PTSD is a fully developed form of traumatic stress that is only diagnosed after experiencing symptoms for at least a month. PTSD occurs when symptoms evolve in the aftermath of an extreme traumatic stressor that overwhelms an individual's coping capacities. PTSD is a serious and potentially debilitating illness. As such, it needs to be managed effectively using established and validated treatments and tools. Deliberate efforts to manage traumatic stress are critical, particularly for organizations that require their personnel to be exposed to high-risk, traumatic situations. This review concludes with a discussion of research priorities for the emergency responder community to manage PTSD in a more systematic way.

Résumé

Le présent rapport vise à fournir à la communauté des intervenants d'urgence des renseignements au sujet du trouble de stress post-traumatique (TSPT). Étant donné que les intervenants d'urgence disposent de très peu de documentation sur le traumatisme dû au stress et le TSPT, le rapport s'appuie sur la documentation militaire et scientifique. L'examen a porté sur les quatre questions suivantes :

- De quelle façon le TSPT devrait-il être défini et reconnu, et quelle est sa prévalence?
- Comment peut-on prévenir le traumatisme dû au stress et le TSPT?
- Comment devrait-on traiter le traumatisme dû au stress et le TSPT?
- Quelles recherches pourraient appuyer la prise en charge du TSPT par la communauté des intervenants d'urgence?

Le TSPT est une forme de traumatisme dû au stress ayant atteint un stade avancé, et il peut seulement être diagnostiquée chez des personnes qui présentent des symptômes depuis au moins un mois. Le TSPT se manifeste lorsque les symptômes évoluent à la suite d'un événement exceptionnellement traumatisant qui inhibe les capacités d'adaptation d'une personne. Le TSPT est une maladie grave et potentiellement invalidante. Ainsi, il doit être pris en charge efficacement à l'aide de traitements et d'outils établis et validés. Il est crucial que des efforts délibérés soient déployés pour prendre en charge le traumatisme dû au stress, en particulier au sein des organisations dont le personnel doit être exposé à des situations à risque élevé et traumatisantes. Le rapport se conclut avec une analyse des priorités en ce qui concerne les travaux de recherche à mener pour assurer une prise en charge plus systématique du TSPT par les intervenants d'urgence.

Executive Summary

POST TRAUMATIC STRESS DISORDER (PTSD) In Emergency Responders Scoping Study: Annotated Bibliography

Adams, B.D., Davis, S., Brown, A., Filardo, E.-A., and Thomson, M., HumanSystems® Incorporated;

Deliberate efforts to manage traumatic stress are critical, particularly for organizations that require their personnel to be exposed to high-risk, traumatic situations. This report aims to inform the emergency responder community about post-traumatic stress disorder (PTSD) and traumatic stress. Given that the available literature within the emergency responder community is very limited, this review relies on the military and scientific literature. This review focused on the following four questions:

- How should PTSD be defined, recognized and how often does it occur?
- How can traumatic stress and PTSD be prevented?
- How should traumatic stress and PTSD be treated?
- What research could support management of PTSD in the emergency responder community?

PTSD is a fully developed form of traumatic stress that is only diagnosed after experiencing symptoms for at least a month. PTSD occurs when symptoms evolve in the aftermath of an extreme traumatic stressor that overwhelms a person's ability to cope. These symptoms involve re-experiencing traumatic events, avoidance, emotional numbing and increased arousal. PTSD incidence rates are generally less than 10% for members of the general population but emergency responders have been shown to have higher rates, estimated by one researcher to be about 17% (full and partial PTSD). PTSD is of particular concern because it is often associated with other challenges, such as suicide, depression and alcohol abuse.

Efforts to lessen the impact of traumatic stress and PTSD typically take the form of education and training (e.g., trying to promote higher levels of resilience and mental toughness). Research showing their efficacy for preventing or lessening PTSD is currently at an early stage. Particularly for personnel in high risk jobs, regular screening for PTSD is agreed to be a critical aspect of prevention.

Treatments for PTSD are somewhat better understood, but this area is still developing. Cognitive behaviour therapy and exposure therapy are clearly noted in the literature as "treatments of choice" for helping personnel suffering from traumatic stress. Many other informal treatments such as psychological first aid and social support are noted to be helpful approaches but are much less established. Personnel who are exposed to traumatic stress must be quickly evaluated to ensure their safety and should be referred to mental health professionals if displaying problematic or atypical behaviour.

As this review shows, then, PTSD is a serious and potentially debilitating illness. As such, it needs to be managed effectively using established and validated treatments and tools. This review concludes with a discussion of research priorities to support the emergency responder community in managing traumatic stress and PTSD.



Table of Contents

ABSTRACT	I
RÉSUMÉ	II
EXECUTIVE SUMMARY	III
TABLE OF CONTENTS	IV
1. INTRODUCTION	1
1.1 OVERVIEW	1
1.2 ASSESSING THE SCIENTIFIC QUALITY OF RESEARCH	1
2. DEFINITION/SYMPTOMS/PREVALENCE OF PTSD	3
2.1 MORE EXPERIENCED AMBULANCE PERSONNEL AT HIGHER RISK OF PTSD DUE TO INCREMENTAL EXPOSURE.....	3
2.2 PROXIMITY TO TRAUMA, SEEING DEATH OF PEERS AND TAKING ON ATYPICAL ROLES CAN INCREASE RISK OF PTSD.....	4
2.3 PTSD CAN SHOW ITSELF YEARS AFTER A TRAUMATIC EVENT (EVEN IF INITIALLY OK).....	5
2.4 PTSD SEVERITY LINKED WITH WISHFUL THINKING AND MENTAL DISENGAGEMENT IN AMBULANCE PERSONNEL.....	6
2.5 EARLY LIFE TRAUMA AND EXPERIENCING VIOLENCE HEIGHTEN RISK OF PTSD	7
2.6 WITNESSING DEATH OR SERIOUS INJURY LINKED WITH HIGHER RATE OF PTSD - PHYSIOLOGICAL MEASURES MIGHT HELP DIAGNOSE PTSD.....	8
2.7 PTSD AND ALCOHOL USE OFTEN OCCUR TOGETHER	9
2.8 PTSD IS NOT ALL OR NOTHING – SUBTHRESHOLD PTSD IS ALSO PROBLEMATIC	10
2.9 PTSD IMPACTS OVER TIME, BUT NOT EVERYONE IS AFFECTED	11
2.10 PTSD DEPENDS ON HOW PEOPLE CONSTRUCT THEIR EXPERIENCE.....	12
2.11 PTSD AND DEPRESSION ARE CLOSELY LINKED BY NUMBING AND RESTLESSNESS – NEED TO BE SHARED WARNING SIGN.....	13
2.12 DIRECT CONTACT WITH SURVIVORS RELATED TO HIGHER PTSD	14
2.13 PTSD (PARTICULARLY NUMBING/DETACHMENT) IS A RISK FACTOR FOR SUICIDE.....	15
2.14 MANY FACTORS LINKED WITH PTSD (E.G., CHILDHOOD ADVERSITY, PREPAREDNESS, NUMBER OF TRAUMAS FACED)	16
2.15 BURNOUT LINKED WITH INCREASED PTSD.....	17
2.16 NO DIFFERENCE IN PTSD RATES AMONG FEMALE/MALE POLICE OFFICERS.....	18
2.17 POLICE OFFICERS HAVE TYPICAL PTSD RATES, BUT DISSOCIATION DURING TRAUMA PREDICTS HIGHER RATES	19
2.18 POLICE OFFICERS’ DISSOCIATION LINKED WITH HIGHER PTSD, SUPPORTIVE RECOVERY ENVIRONMENT LINKED WITH LOWER PTSD.....	20
2.19 INCURRING PHYSICAL INJURY LINKED WITH INCREASED PTSD	21
2.20 PTSD LINKED WITH BURNOUT IN NURSES.....	22
2.21 PTSD RATES LOWER IN FIREFIGHTERS THAN PUBLIC – HIGH WORK STRESS AND LOW SOCIAL SUPPORT (BUT NOT TRAUMA EXPOSURE) PREDICT PTSD.....	23
2.22 HIGH SOCIAL SUPPORT LINKED WITH DECREASED PTSD AND SUICIDE RISK	24
2.23 PHYSICAL PAIN DURING TRAUMA INCREASES PTSD RISK	25
2.24 PHYSICAL INJURY AND ATYPICAL ROLES LINKED WITH HIGHER PTSD	26
2.25 WOMEN MORE LIKELY TO DEVELOP PTSD THAN MEN.....	27
2.26 SUBTHRESHOLD PTSD LINKED WITH DEPRESSION, ALCOHOL, POOR HEALTH	28
2.27 BOTH MENTAL AND PHYSICAL STATUS SHOULD BE USED TO DIAGNOSE PTSD	29

2.28	DEATH OR INJURY TO LOVED ONES OR COLLEAGUES MOST PREDICTIVE OF PTSD IN NURSES AND AMBULANCE PERSONNEL.....	30
2.29	PARTIAL AND FULL PTSD IN BRAZILIAN AMBULANCE WORKERS.....	31
3.	PREVENTION OF PTSD.....	32
3.1	EXPOSURE TO TRAUMA INCREASES CHANCE OF PTSD.....	32
3.2	PROPER PTSD MANAGEMENT REQUIRES ORGANIZATIONAL COMMITMENT	33
3.3	STRESS INOCULATION TRAINING MAY HELP PREVENT PTSD	34
3.4	PTSD LEVELS COMMON IN DIFFERENT NURSES, SOCIAL SUPPORT HELPS MINIMIZE ONSET OF PTSD...35	
3.5	CLINICAL SUPPORT FOUND FOR COLLABORATIVE CARE, EXTENDED OUTPATIENT THERAPY, AND MODIFIED PE	36
3.6	GOOD SOCIAL SUPPORTS LINKED WITH LOWER RISK OF PTSD.....	37
3.7	HIGH MISSION PREPAREDNESS LINKED WITH LOWER RISK OF PTSD	38
3.8	LOW PEER SUPPORT AND EMOTIONAL EXPRESSION ASSOCIATED WITH HIGHER RATES OF PTSD IN STUDENT PARAMEDICS	39
4.	TREATMENT OF PTSD.....	40
4.1	INTERVENTIONS FOR PTSD AND TRAUMA IN EMERGENCY AMBULANCE PERSONNEL – POOR SUPPORT FOR CRITICAL INCIDENT DEBRIEFING.....	40
4.2	EMDR NOT PROVEN AS EFFECTIVE TREATMENT FOR PTSD	41
4.3	PSYCHOLOGICAL DEBRIEFING (CRITICAL INCIDENT STRESS DEBRIEFING) SHOULD NOT BE USED	42
4.4	CBT, EDMR AND STRESS MANAGEMENT EFFECTIVE TREATMENTS FOR PTSD	43
4.5	COGNITIVE PROCESSING THERAPY AND PROLONGED EXPOSURE CAN REDUCE PTSD SYMPTOMS	44
4.6	MINDFULNESS LINKED WITH DECREASE IN PTSD SYMPTOMS.....	45
4.7	WEB-BASED INTERVENTIONS AND VIRTUAL REALITY EXPOSURE PROPOSED TO TREAT PTSD	46
4.8	PTSD TREATMENTS ARE CONTENTIOUS – COGNITIVE BEHAVIOUR THERAPIES ARGUED TO BE MOST EFFECTIVE	47
4.9	BARRIERS TO THE ACCEPTANCE OF EBTs COME FROM SEVERAL SOURCES, BUT CAN BE OVERCOME...48	
4.10	NON-MILITARY TRAUMA INTERACTS WITH COMBAT EXPOSURE TO INCREASE THE SEVERITY OF PTSD	49
4.11	DEBRIEFING DOES NOT REDUCE PTSD – EVIDENCE INCONCLUSIVE FOR THE EFFECTIVENESS OF OTHER TREATMENTS	50
4.12	A CASE STUDY OF TRAUMA-FOCUSED TREATMENT FOR PTSD	51
4.13	EVIDENCE SUPPORTS THE USE OF CBT AND BEP.....	52
4.14	EFFECTIVE SHORT-TERM TREATMENT FOR PTSD AND DEPRESSION.....	53
4.15	INTEGRATED TREATMENT PROGRAMS REQUIRED IF COMORBID DIAGNOSES EXIST.....	54
4.16	PSYCHOTHERAPEUTIC AND PHARMACOLOGICAL INTERVENTIONS FOUND TO BE USEFUL FOR THE TREATMENT OF PTSD	55
4.17	PSYCHOTHERAPY, PSYCHOEDUCATION, AND MEDICATION MANAGEMENT EFFECTIVE TREATMENTS ESPECIALLY WHEN INITIAL PTSD SYMPTOMS ARE SEVERE	56
4.18	SOCIO-CULTURAL ENVIRONMENT, SOCIAL NETWORK, AND SYSTEM-LEVEL FACTORS KEY TO THE INITIATION OF TREATMENT FOR PTSD	57
4.19	NO TREATMENT IS RIGHT FOR EVERYONE AFTER A TRAUMA, BUT CBT IS EFFECTIVE FOR THOSE SHOWING TRAUMA STRESS SYMPTOMS	58
4.20	NATIONAL ACADEMIES PRESS - COMPREHENSIVE GUIDELINES ON THE PREVENTION, DIAGNOSIS, AND TREATMENT OF PTSD	59
5.	MULTIPLE TOPICS RELATED TO PTSD.....	60
5.1	A GUIDE TO THE BEST INTERVENTIONS AND TIMING OF CARE FOR PTSD PATIENTS.....	60
5.2	PTSD TREATMENT COMPLICATED BY EXISTING MENTAL HEALTH ISSUES.....	61
5.3	PTSD RATES – 30-40% DIRECT VICTIMS, 10-20% RESCUE WORKERS AND 5-10% IN GENERAL POPULATION.....	62

REFERENCES **63**



1. Introduction

1.1 Overview

This annotated bibliography reviews articles relevant to the emergency responder community in terms of its management of traumatic stress and PTSD specifically. Articles are organized to roughly correspond to the structure of the chapters used in the full literature review also produced as part of this project.

The literature reviewed was often quite complex. We attempted to make it more accessible to emergency responders by creating a short “headline” at the top of each summary that provided a very easy summary of the core point of the article. Moreover, we also added a section entitled “Relevance to First Responders/Receivers” that briefly summarizes the key take home points.

1.2 Assessing the Scientific Quality of Research

As part of our analysis of the articles in this annotated bibliography, we also made an assessment of the scientific quality of the studies that were reviewed. This was based, in part, on a checklist developed by Kmet, Lee, and Cook (2004). This checklist, which was developed to evaluate primary research papers across a variety of fields, lists 14 criteria to be rated for quantitative studies (see Table 1).

Table 1. Criteria for assessing scientific quality of quantitative research

Question/objective sufficiently described?
Study design evident and appropriate?
Method of subject/comparison group selection or source of information/input variables described and appropriate?
Subject (and comparison group, if applicable) characteristics sufficiently described?
If interventional and random assignment was possible, was it described?
If interventional and blinding of investigators was possible, was it reported?
If interventional and blinding of subjects was possible, was it reported?
Outcome and (if applicable) exposure measure(s) well defined and robust to measurement/misclassification bias? Means of assessment reported?
Sample size appropriate?
Analytic methods described/justified and appropriate?
Some estimate of variance is reported for the main results?
Controlled for confounding?
Results reported in sufficient detail?
Conclusions supported by the results?



A study was considered of high quality if all or most (80%) of the applicable criteria were met. A study was considered to be of medium quality if a majority (70%) of the applicable criteria were at least partially met. Below that, the study was considered to be of poor quality.

For this annotated bibliography, scientific quality was primarily based on whether or not the report was published in a peer-reviewed journal (i.e., because they tend to be higher quality and have more stringent scientific standards), the experimental designs that were used, evidence of reliability and validity of the measures used, experimental control and sample sizes. Overall, then, the scientific quality rating (low, medium, high) provided for each article in the annotated bibliography helps to advise how much confidence one can have when in relying on the research findings.

2. Definition/Symptoms/Prevalence of PTSD

2.1 More experienced ambulance personnel at higher risk of PTSD due to incremental exposure

<p>Full Reference: BENNETT, P., WILLIAMS, Y., PAGE, N., HOOD, K., WOOLLARD, M., & VETTER, N. 2005. Associations between organizational and incident factors and emotional distress in emergency ambulance personnel. <i>British Journal of Clinical Psychology</i>, 44, 215-226.</p>	
<p>Purpose of the Study: To study the prevalence and correlates of PTSD, anxiety and depression among emergency ambulance personnel.</p>	
<p>Method/Measures: .Emergency ambulance personnel (N = 617) in a large British ambulance service completed a questionnaire. Measures included prevalence of PTSD, anxiety and depression, as well as degree of stress related to incident and to organization, and cognitive appraisals of stressful events.</p>	
<p>Scientific Quality: <i>Peer-reviewed. The authors used established statistical methods and had a moderate sample size. Quality = high.</i></p>	
<p>Core Findings: 22% of participants met criteria for a diagnosis of PTSD. Predictors of PTSD severity were organizational stress, frequency of experiencing potentially traumatic incidents were encountered, length of service, and dissociation at the time of a traumatic incident.</p>	
<p>Type of Sample/ Emergency Responder: Emergency medical technicians, paramedics</p>	<p>Relevance: The findings from this study suggest that ambulance workers may have relatively high rates of PTSD. Ambulance personnel working in the profession for longer periods of time (and subsequently, having attended more traumatic incidents) appear to be more likely to be at risk for PTSD. This supports the assertion that one of the dangers of PTSD is incremental exposure over time. Organizational stressors, such as tensions with colleagues, also appear to be risk factors for PTSD.</p>



2.2 Proximity to trauma, seeing death of peers and taking on atypical roles can increase risk of PTSD

<p>Full Reference: BERNINGER, A., WEBBER, M.P., COHEN, H.W., GUSTAVE, J., LEE, R., NILES, J.K., CHIU, S., ZEIG-OWENS, R., SOO, J., KELLY, K., & PREZANT, D.J. 2010. Trends of elevated PTSD risk in firefighters exposed to the World Trade Center Disaster: 2001-2005. <i>Public Health Reports</i>, 125, 556-566.</p>	
<p>Purpose of the Study: To track the prevalence of elevated PTSD risk and variables associated with elevated PTSD risk in firefighters who were present during the first two weeks of the World Trade Center (WTC) attack during the four years following the attack.</p>	
<p>Method/Measures: Questionnaires were completed annually by firefighters ($n = 10,074$) for four years following the WTC attacks. Measures addressed elevated PTSD risk (PTSD diagnosis can only be made by a trained clinician, not through a questionnaire), psychosocial support and counseling, change in alcohol use, change in exercise habits, work-related stressors, functional health, and arrival time on scene (i.e., morning of 9/11, afternoon of 9/11, day after 9/11, up to 2 weeks after 9/11).</p>	
<p>Scientific Quality: <i>Peer reviewed - medium to high quality. The study had a very large sample that was administered to virtually all of the NYFD who survived 9/11. However, the study is a self-report study using pre-existing data.</i></p>	
<p>Core Findings: Firefighters meeting the criteria for elevated PTSD risk over the 4 years were fairly consistent at about 10% (9.9%, 9.8%, 11.7%, 10.6%). The most common symptoms of elevated PTSD risk arousal, re-experiencing, and avoidance/numbing.</p> <p>Variables associated with elevated PTSD risk included arrival time (i.e., the morning of 9/11, the afternoon of 9/11, the day after, 2-13 days after); receiving counseling services; reporting an increase in alcohol use; reporting a decrease in exercise because an individual did not feel like it; obtaining emotional support from family, friends, or coworkers; being awarded a disability retirement pension; and the number of deaths in the firehouse where a member was stationed on 9/11.</p> <p>In addition, firefighters required to assume atypical supervisory responsibilities during the collapse (i.e., tasks that were not normally assigned to them)—had almost twice the odds of having elevated PTSD risk than officers trained in supervision.</p>	
<p>Type of Sample/ Emergency Responder: Firefighters</p>	<p>Relevance: Findings show that proximity to traumatic event, death of service member(s), and supervisory experience are all risk factors for PTSD. That is, first responders involved during the most traumatic time of an incident (i.e., the morning of 9/11) were at greater risk of developing PTSD symptoms, as were first responders who observed one or more service members dying on scene. In addition, first responders who take on atypical supervisory roles for traumatic incidents are also at greater risk of PTSD.</p>

2.3 PTSD can show itself years after a traumatic event (even if initially ok)

<p>Full Reference: BERNINGER, A., WEBBER, M.P., NILES, J.K., GUSTAVE, J., LEE, R., COHEN, H.W., KELLY, K., CORRIGAN, M., & PREZANT, D.J. 2010. Longitudinal study of probable post-traumatic stress disorder in firefighters exposed to the World Trade Center disaster. <i>American Journal of Industrial Medicine</i>, 53, 1177 – 1185.</p>	
<p>Purpose of the Study: To examine delayed onset probably PTSD rates and potential risk factors for New York City firefighters who worked on the World Trade Center (WTC) site.</p>	
<p>Method/Measures: The researchers examined annual monitoring exam questionnaires completed by firefighters ($n = 5,656$) within 6 months of 9/11 and again 3-4 years after the attacks. Delayed onset probably PTSD was defined as those firefighters who did not meet the criteria for probable PTSD in their baseline questionnaire, but did meet the criteria at follow-up. Measures were included for probable PTSD, functional impairment at home or work, change in alcohol use, number of months worked on scene, arrival time on scene. Multivariable logistic regression models were used to identify independent predictors of probable PTSD and delayed onset probable PTSD.</p>	
<p>Scientific Quality: <i>Peer reviewed. This study was published in a peer-reviewed article and had a very large sample. However, the study is a self-report study using pre-existing data. Medium to high quality.</i></p>	
<p>Core Findings: In all, 15.5% of the sample ($n = 878$) firefighters had probable PTSD scores on one or both questionnaires: 8.6% ($n = 487$) within 6 months of 9/11 and 11.1% on average 3 years later ($n = 626$). Delayed onset probable PTSD was reported by 6.9% ($n = 391$) of participants. Those with probable PTSD at baseline and those with delayed onset PTSD were more likely to report functional impairments and increased alcohol use than were the resilient group (i.e., no probable PTSD at either time). The delayed onset group was also more likely to have arrived earlier and worked longer at the WTC site.</p>	
<p>Type of Sample/ Emergency Responder: Firefighters</p>	<p>Relevance: This article provides evidence that first responders/receivers can exhibit PTSD symptoms years after a traumatic event, even if they did not meet PTSD criteria within 6 months of the event. Years later these symptoms are still associated with impaired functioning at home and at work, and with increased alcohol use.</p>

2.4 PTSD severity linked with wishful thinking and mental disengagement in ambulance personnel

<p>Full Reference: CLOHESSY, S., & EHLERS, A., 1999. PTSD symptoms, response to intrusive memories and coping in ambulance service workers. <i>British Journal of Clinical Psychology</i>, 38, 251-265.</p>	
<p>Purpose of the Study: To examine the relationship of coping strategies and responses to intrusive memories with PTSD and other psychiatric symptoms in ambulance service workers.</p>	
<p>Method/Measures: Paramedics and technicians (N = 56) from the Oxfordshire ambulance service completed a survey with measures of sources of stress, post-traumatic symptoms, psychiatric symptoms, coping strategies, and response to intrusive memories. Data was analyzed using correlations and multiple regression.</p>	
<p>Scientific Quality: Peer-reviewed. The authors used established statistical methods and had a moderate sample size. Quality = high.</p>	
<p>Core Findings: 21% of participants met the criteria for PTSD. The most common PTSD symptoms were intrusive memories, feelings of irritability, sleep problems, and detachment from others.</p> <p>The most common event leading to post-traumatic intrusive memories involved the death of another person (e.g., fatal road accidents involving either the death of children or of someone the participant knew, particularly distressing rescue operations).</p> <p>PTSD severity was positively associated with coping strategies that involved wishful thinking and mental disengagement. PTSD severity was also significantly linked with a number of intrusive memories, including negative interpretation of memories, rumination, suppression, and dissociation.</p>	
<p>Type of Sample/ Emergency Responder: Paramedics, technicians</p>	<p>Relevance: The findings from this study suggest that ambulance workers may have relatively high rates of PTSD. Ambulance workers who have attended incidents in which people die, especially if it is the death of a child, are most likely to exhibit PTSD symptoms. Interventions for ambulance workers should focus on avoiding wishful thinking and mental disengagement, as well as helping personnel to find positive ways to deal with intrusive memories.</p>

2.5 Early life trauma and experiencing violence heighten risk of PTSD

Full Reference: BERNTSEN, D., JOHANNESSEN, K. B., THOMSEN, Y. D., BERTELSEN, M., HOYLE, R. H., & RUBIN, D. C. 2012. Peace and war: Trajectories of posttraumatic stress disorder symptoms before, during, and after military deployment in Afghanistan. *Psychological Science*, 23, 1557-1565.

Purpose of the Study: To examine the course of PTSD among soldiers before, during, and after deployment into an active theatre of engagement to develop a more accurate picture of PTSD symptoms across individuals.

Method/Measures: Danish soldiers ($n = 746$) completed questionnaires on five occasions: before deployment, during deployment (between 2 and 5 months in), 1 to 3 weeks after returning from deployment, 2 to 4 months after returning from deployment, and 7 to 8 months after returning from deployment. Of the initial sample, only 366 soldiers had data available from prior to their deployment, during their deployment, and at least one time after their return home. The measures included the civilian version of the PTSD Checklist (PCL), the Beck Depression Inventory (BDI – II), the scale for Neuroticism from the NEO Five Factor Inventory, the Traumatic Life Events Questionnaire (TLEQ), the Combat Exposure Scale (CES), and a Danger/Injury Exposure Scale from the Danish military measured perceived war-zone stress, but not stress of direct combat. Single item measures of earlier emotional problems, emotional stress during deployment, times when their life or another's life was in danger, whether the soldier was wounded or injured during deployment, and whether or not they had killed an enemy combatant during deployment were also included. Latent class growth analyses were conducted to model the trajectories of PTSD symptoms from pre-deployment to approximately 7 months after returning home.

Scientific Quality: *Peer Reviewed. The objective was described. Multiple data collection intervals allowed the researchers to investigate a non-linear development of PTSD. Appropriate statistical analyses were conducted for the objective stated by the authors. The sample size was large, however, a clear description of the overall characteristics of the sample was not provided. Most of the measures that were used were well established but psychometric properties not discussed. Results were well described and the conclusions followed logically from the results. Medium to high quality.*

Core Findings: The authors found 6 distinct trajectories of PTSD. Most participants fell into one of two resilient groups (resilient or extremely resilient) for whom PTSD symptoms did not change over time. The new-onset group showed few signs of PTSD prior to and during deployment, but showed increased symptoms after that. The remaining three groups showed a decrease of PTSD symptoms from pre-deployment to during deployment, though the symptoms returned to the same or higher levels by 7 months after their return. Resilience was negatively related to depression, neuroticism, previous traumatic events, and emotional problems prior to deployment. A key variable differentiating the new-onset group from the resilient group was the number of previous traumas they had experienced, especially interpersonal violence in childhood. Personnel who showed improvement during deployment had experienced more childhood trauma and were less well educated than the resilient groups. The authors hypothesized that the protective effects of deployment may be related to an increased level of support from fellow soldiers during deployment that cannot access at home.

**Type of Sample/
Emergency
Responder:**
Military

Relevance: A history of trauma, especially experiences of interpersonal violence during childhood, may leave first responders/receivers more vulnerable to developing PTSD upon exposure to trauma in the field. Particular attention and support should be afforded these high risk individuals.



2.6 Witnessing death or serious injury linked with higher rate of PTSD - Physiological measures might help diagnose PTSD

<p>Full Reference: CARSON, M.A., PAULUS, L.A., LASKO, N.B., METZGER, L.J., WOLFE, J., ORR, S.P., & PITMAN, R.K. 2000. Psychophysiological assessment of posttraumatic stress disorder in Vietnam nurse veterans who witnessed injury or death. <i>Journal of Consulting and Clinical Psychology</i>, 68, 890-897.</p>	
<p>Purpose of the Study: To determine if people who witness death or injury in military operations would later show PTSD related psychophysiological symptoms when recollecting their traumatic experience in war (in comparison to other traumatic life experiences, using script-driven imagery).</p>	
<p>Method/Measures: Participants were Vietnam War nurse veterans, and recruited and screened through a nationwide mailing campaign. At the outset, participants completed the Clinician-Administered PTSD Scale-Diagnostics Version (CAPS) and the Structured Clinical Interview for DSM (SCID). The diagnostic interviews centered on the most traumatic event witnessed in Vietnam, involving death or serious injury, and acted as one of the events for psychophysiological testing. Participants were split into two groups, current PTSD or non-PTSD, according to the CAPS. Participants developed 5 personal scripts – 2 stressful Vietnam events, most stressful life non-Vietnam event, most positive life event, and a neutral event. Scripts were recorded in a neutral voice to play back later in the lab. For experimentation, participants listened to the scripts, continued to imagine it, and then asked to relax or recover. Psychophysiological responses were recorded by the Coulbourn Modular Instrument System for heart rate (HR), skin conductance (SC), and electromyograms (EMGs) of facial muscles. Participants also rated their emotional state after listening to the 5 scripts.</p>	
<p>Scientific Quality: Peer reviewed. Experiment; scripts presented in quasi-random order; strong measures; small sample size = high quality.</p>	
<p>Core Findings: PTSD participants had overall larger physiological responses than the non-PTSD participants when recollecting traumatic experiences from Vietnam. Self-reported emotional responses did not differ. Nurses' highest rated emotional response to the traumatic events was sadness. These results suggest witnessing death and serious injury of others is stressful enough to cause PTSD. Beyond self-report, psychophysiological measures add objectivity when assessing PTSD.</p>	
<p>Type of Sample/ Emergency Responder: Military Nurses</p>	<p>Relevance: As many first responders witness death or serious injury, this research demonstrates that this can potentially lead to PTSD. Psychophysiological responses related to PTSD can be invoked when merely recollecting traumatic experiences. Re-writing traumatic experiences in less harmful ways may be a means to mitigate PTSD symptoms.</p>

2.7 PTSD and alcohol use often occur together

<p>Full Reference: CARTER, A.C., CAPONE, C., & EATON SHORT, E. 2011. Co-occurring posttraumatic stress disorder and alcohol use disorders in veteran populations. <i>Journal of Dual Diagnosis</i>, 7, 285-299.</p>	
<p>Purpose of the Study: Carter et al. (2011) review the literature on the comorbidity of alcohol abuse (i.e. alcohol use disorder) and PTSD. They provide a case study of a Vietnam veteran who suffered several decades of PTSD and alcohol use disorder.</p>	
<p>Method/Measures: This study is a review and discussion of the literature available. The researchers did not obtain their own raw data and there is no statistical analysis.</p>	
<p>Scientific Quality: <i>Peer-reviewed. Carter et al. (2011) thoroughly examine the literature but do not perform any systematic analysis and rely on a case study rather than controlled research. Quality = medium.</i></p>	
<p>Core Findings: According to Pietrzak et al. (2011), 40% of those with PTSD have alcohol use disorder. Combat trauma in particular is both highly linked with heavy alcohol consumption (Hoge, 2004) and higher rates of re-experiencing, hyper-arousal, and avoidance symptoms of PTSD compared to trauma from civilian related crimes (Ullman, 1995). Frequency of deployment was also correlated with alcohol use (Fontana & Rosenheck, 2010). Leeies et al. (2010) reports that individuals with both PTSD and alcohol use disorder are more likely to attempt suicide and have decreased quality of life.</p> <p>Self-medication theory posits that PTSD victims turn to alcohol as a way to escape anxiety and negative emotions (Robinson et al., 2009; Waldrop et al., 2007); subsequently, they become reliant and experience increased anxiety if they quit drinking (Jacobsen et al., 2001). Approximately 20% of PTSD sufferers (veterans and civilians) admit to using alcohol to treat their symptoms (Leeies, 2010).</p> <p>Carter et al. (2011) explain that sequential approach treatments aim to treat alcoholism first and proceed with PTSD treatments when the patient is sober; however, success with this method has been limited. Parallel treatments focus on treating both disorders simultaneously, and have higher rates of success. Integrated treatments, such as Integrated Cognitive Behavioural Therapy, yield best results (cf. McGovern et al., 2009).</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: The frequency of trauma exposure relating to higher risk of alcohol abuse is particularly troubling for first responders with PTSD given that they are continually exposed to traumatic events. Risk of alcohol use disorder in first responders as a correlate of PTSD is a research area that requires exploration.</p>



2.8 PTSD is not all or nothing – Sub-threshold PTSD is also problematic

<p>Full Reference: CUKOR, J., WYKA, K., JAYASINGHE, N., & DIFEDE, J. 2010. The nature and course of sub-threshold PTSD. <i>Journal of Anxiety Disorders</i>, 24, 918–923.</p>	
<p>Purpose of the Study: Prevalence of sub-threshold PTSD (also referred to as partial or sub-syndromal PTSD) was investigated following the World Trade Center disasters of 9/11. Cukor et al. (2010) intended to show that PTSD is a valid diagnosis, distinct from full PTSD (also called classic PTSD) and no PTSD.</p>	
<p>Method/Measures: The researchers obtained data from 3523 (97% male) relief workers at three time periods following the attacks of 9/11. Participants were scheduled for interviews within one year following their exposure (Time 1), after 2 years (Time 2), and then had their final interview 3 years after exposure (Time 3). These interviews consisted of a structured assessment with a clinician, as well as completion of the following measures: Clinician Administered PTSD Scale (CAPS), Beck Depression Inventory (BDI), Traumatic Events Interview (TEI), Sheehan Disability Scale, and a basic demographic questionnaire, including elements of exposure.</p>	
<p>Scientific Quality: <i>Peer-reviewed. The researchers explain all measures used and their method of data analysis. Furthermore, they explain how they dealt with missing data. The sample size is large, despite being disproportionately male. Participants were not self-selected. Quality = high.</i></p>	
<p>Core Findings: At Time 1, rates for sub-threshold PTSD were higher than rates for full PTSD. Levels of impairment between those with full PTSD, sub-threshold PTSD, and no PTSD differed significantly, supporting the need to distinguish between full and sub-threshold PTSD. Relief workers with sub-threshold PTSD (and full PTSD) showed significantly higher levels of previous trauma exposure and psychiatric history compared to those with no PTSD. However, the majority of participants who met criteria for sub-threshold PTSD at Time 1 showed no signs of PTSD at Time 2 and this trend continued between Time 2 and Time 3.</p>	
<p>Type of Sample/ Emergency Responder: Disaster recovery workers</p>	<p>Relevance: This study reiterates the notion that even sub-threshold PTSD impairs individuals' regular functioning and requires clinical attention. It is important to consider the diagnostic criteria for sub-threshold PTSD when assessing first responders for classic PTSD.</p>

2.9 PTSD impacts over time, but not everyone is affected

<p>Full Reference: CUKOR, J., WYKA, K., MELLO, B., OLDEN, M., JAYASINGHE, N., ROBERTS, J., GIOSAN, C., CRANE, M., & DIFEDE, J. 2011. The longitudinal course of PTSD among disaster workers deployed to the World Trade Center following the attacks of September 11th. <i>Journal of Traumatic Stress</i>, 24, 506-514.</p>	
<p>Purpose of the Study: The authors aimed to examine the long-term mental health outcomes for non-rescue disaster workers (i.e., those not involved in search and rescue) deployed to the World Trade Center (WTC) site in the days and weeks following the 9/11 attacks. Their aim was to understand the course of PTSD over an extended period of time.</p>	
<p>Method/Measures: The authors assessed non-rescue disaster workers deployed to the WTC site in the days and weeks following the 9/11 attacks at three intervals: approximately 19 months ($n = 2960$), 40 months ($n = 2556$), and 77 months ($n = 1983$) after the attacks. For the first two intervals, participants were assessed with both a clinical interview and a self-administered questionnaire, while at Time 3 only 770 participants had clinical assessments, while all 1983 completed the self-administered questionnaire. PTSD was assessed using the Clinician Administered PTSD Scale (CAPS) and the Posttraumatic Stress Checklist – Civilian Version (PCL-C), which was a self-administered questionnaire. Other psychopathology was assessed using the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders (SCID) modules for major depression, panic disorder, and generalized anxiety disorder. Participants also completed the WTC Exposure Questionnaire to assess their degree of both occupational and personal exposure to the 9/11 attacks. Finally, the Traumatic Events Interview assessed participants' trauma history.</p>	
<p>Scientific Quality: <i>Peer reviewed. The study objectives were well described and the sample size was quite large, especially given that clinical assessments were conducted for all participants at both Time 1 and Time 2. The introduction of a more cost-effective approach prior to Time 3 meant that only a subsample (those identified as at high risk for PTSD and related psychopathologies and a random subsample not identified as high risk) were assessed by a psychologist. The remaining participants only completed self-report measures. This meant that the data set was incomplete. There were demographic differences between those who participated at Time 3 and those who dropped out (e.g., older, more likely to be Caucasian, less educated, and married). While there was a question that asked participants whether or not they were receiving treatment, there was no other information provided about the treatment (e.g., type, length, etc.). No comparison group was identified and assessed. Medium to high quality.</i></p>	
<p>Core Findings: Trauma history, major depression, occupational exposure to the WTC site, and panic disorder at time one predicted PTSD status or symptom severity 6 years after 9/11. The authors note that 51% of those with complete data never developed PTSD; however, based on the data from Time 1 and Time 2, they suggest that the true number of those who never developed PTSD was closer to 69.5%.</p>	
<p>Type of Sample/ Emergency Responder: Disaster recovery workers</p>	<p>Relevance: Disaster workers, like first responders/receivers, are particularly vulnerable to a variety of mental health issues, including PTSD, because they are repeatedly exposed to trauma as part of their work. Mandatory screening programs, especially for high risk individuals (i.e., those with a trauma history, major depression, panic disorders, and increased occupational exposure to traumatic incidences), that offer education and resources for treatment could benefit first responders/receivers.</p>



2.10 PTSD depends on how people construct their experience

<p>Full Reference: DIRKZSWAGER, A.J.E., BRAMSEN, I., &VAN DER PLOEG, H.M. 2005. Factors associated with posttraumatic stress among peacekeeping soldiers. <i>Anxiety, Stress, and Coping</i>, 18, 37-51.</p>	
<p>Purpose of the Study: Dirkzwager, Bramsen, and Van der Ploeg examined the impacts of peacekeeping operations, PTSD prevalence, and factors contributing to PTSD symptoms.</p>	
<p>Method/Measures: A sample of 3,481 Dutch peacekeeping veterans completed a questionnaire that explored the trauma they had experienced, PTSD symptoms, and their general experience of peacekeeping (i.e., positive and negative effects). Approximately three-quarters had served in Lebanon, former Yugoslavia, or Cambodia, while the remainder served in various peacekeeping missions. The average time between deployment and the study was 6.1 years.</p>	
<p>Scientific Quality: <i>Peer reviewed, good methodological approach, good measures, good sample size; but retrospective self-reporting sampling makes it challenging to make causal inferences, measures need to be validated = medium quality .</i></p>	
<p>Core Findings: On average, 12% of peacekeepers sought professional help while on the mission, and 15% of those met the criteria for PTSD. They faced an average of 4.4 potentially traumatic situations when deployed. Most frequently reported stressful situations were shootings not directed at the self (76%), witnessing human distress (64%), insufficient means to intervene (51%), and viewing wounded or dead people (50%). In total, 190 veterans (5.6%) showed full symptoms of PTSD, whereas others showed only some of the symptoms (15.5%). Factors significantly associated with PTSD included lower level of education, being single, having experienced more traumatic situations, having no control over the situation and feeling powerlessness. Perceptions of threat and a sense that the mission was meaningless were significantly positively related to level of PTSD symptoms.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: Though a relatively low number of peacekeepers show full blown PTSD symptoms (5.6%), this research showed that they can persist many years after the events. There are potential risk factors that may also extend to first responders. Experiencing a number of potentially traumatic situations was associated with PTSD. Individuals' subjective appraisals of the situation were also associated with PTSD. This shows the importance of subjective perceptions or personal meaning constructions of a traumatic event (e.g., having no control or feeling powerless). The finding that single individuals were more impacted by traumatic exposure suggests the importance of social supports. Given the infrequency of help-seeking behaviour of those veterans expressing PTSD symptoms, institutions may benefit their members through proactive support to prevent long-term adjustment problems.</p>

2.11 PTSD and depression are closely linked by numbing and restlessness – need to be shared warning sign

<p>Full Reference: ELHAI, J.D., CONTRACTOR, A.A., PALMIERI, P.A., FORBES, D., & RICHARDSON, J.D. 2011. Exploring the relationship between underlying dimensions of PTSD and depression in a national, trauma-exposed military sample. <i>Journal of Affective Disorders</i>, 133, 477-480.</p>	
<p>Purpose of the Study: Elhai et al. (2011) examined the relationship between PTSD and major depression in a sample of military veterans post-deployment. They hypothesized that depressive affect in depression would be most highly correlated with dysphoria (numbing and/or decreased responsiveness, anxiety, and restlessness) in PTSD than with other PTSD symptoms.</p>	
<p>Method/Measures: The researchers used archival data, which was obtained by Veterans Affairs Canada (VAC) in 1999 using a sample of 2760 (96% male) Canadian veterans. PTSD symptom information was obtained using the military version of the PTSD Checklist (PCL; depression was measured using the Center for Epidemiological Studies-Depression Scale (CES-D).</p>	
<p>Scientific Quality: <i>Peer reviewed. The introduction (literature review) and conclusion sections are quite short. The researchers give detailed explanations of their models and statistical analyses in such a way that the study could be easily replicated. Measures are self-reported. Quality = medium to high.</i></p>	
<p>Core Findings: Elhai et al. (2011) found support for their models comparing PTSD and depression, which supports previous literature. Their hypothesis was supported; they found that dysphoria in those with PTSD had the greatest link with somatic problems and depressive affect scores on the CES-D. Thus, they argue that the shared variance between PTSD and depression may be due to dysphoria.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: The current study recognizes and supports that there is a high comorbidity of PTSD and depression and that the overlap may be mostly due to dysphoric symptoms (numbing, anxiety, and restlessness). In the first responder/receiver domain, it is important to be aware of the warning signs of both disorders, as PTSD might be easily mistaken for depression alone.</p>



2.12 Direct contact with survivors related to higher PTSD

<p>Full Reference: FULLERTON, C.S., URSANO, R.J., & WANG, L. 2004. Acute stress disorder, posttraumatic stress disorder, and depression in disaster or rescue workers. <i>American Journal of Psychiatry</i>, 161, 1370-1376.</p>	
<p>Purpose of the Study: Following a real-life United Airlines plane crash with many casualties, disaster relief workers were compared with non-exposed disaster workers on development of acute stress disorder (ASD), posttraumatic stress disorder (PTSD), and depression.</p>	
<p>Method/Measures: Disaster workers exposed to trauma (n = 207; 88% male) were assessed within one month of the crash, and this group was compared to another group of disaster workers who were not exposed to trauma. Acute stress disorder was assessed using a measure validated by Staab et al. (1996) which follows the DSM-IV criteria for ASD. PTSD was measured using the DSM PTSD-IV Scale (Norris & Riad, 1997; Ursano & Fullerton, 1997; Fullerton et al., 2000) and the Zung Self-Rating Depression Scale was used for depression assessment. Assessments were taken at several points after exposure (1, 2, 7, and 13 months).at three different points following the disaster.</p>	
<p>Scientific Quality: <i>Peer-reviewed. Explanation of statistical analyses is acceptable. Although sample size is not even between the comparison groups, the exposed group still yields a decent size. Explain rationale well. Quality = medium to high.</i></p>	
<p>Core Findings: Disaster workers exposed to trauma who were unmarried were at greater risk for ASD, but not PTSD. Exposure and previous disaster experience both increased the risk of developing PTSD at 13 months post-exposure, even when controlling for ASD and depression. Personnel showing ASD were more likely to develop PTSD at 13 months. Depressed personnel exposed to trauma at 7 months were nearly ten times more likely to develop PTSD at 13 months than non-depressed exposed workers; nearly half of all exposed workers with PTSD also suffered from depression. Finally, exposed workers who had directly assisted survivors were nearly three times more likely to develop PTSD than disaster workers who did not assist survivors.</p>	
<p>Type of Sample/ Emergency Responder: Disaster recovery workers</p>	<p>Relevance: What is perhaps most alarming in this study is the finding that helping survivors puts a worker at nearly three times the risk of developing PTSD compared to those who do not directly help. First responders are frequently exposed to traumatic events and are nearly always involved with survivors and/or victims. This study supports that exposure alone is a great risk factor but also that directly assisting survivors/victims can contribute to the development of PTSD as well.</p>

2.13 PTSD (particularly numbing/detachment) is a risk factor for suicide

Full Reference: GUERRA, V. S. & CALHOUN, P. S. 2011. Examining the relation between posttraumatic stress disorder and suicidal ideation in an OEF/OIF veteran sample. *Journal of Anxiety Disorders*, 25, 12-18.

Purpose of the Study: The authors aimed to understand the relationship between PTSD and suicidal ideation. Specifically, they aimed to understand whether PTSD increased one's risk of suicidal ideation on its own or whether it two challenges often associated with PTSD (i.e., major depressive disorder; MDD and alcohol use disorder; AUD) actually increases this risk.

Method/Measures: The sample for this study was 393 veterans who had deployed to a region of conflict during Operation Enduring Freedom and/or Operation Iraqi Freedom. The Structured Clinical Interview for DSM-IV-TR-Axis I (SCID) was administered to participants along with a series of self-report questionnaires including the Beck Scale for Suicide Ideation (BSS) or the Scale for Suicide Ideation – Adapted (SSI-A), the Beck Depression Inventory – Second Edition (BDI-II), the Davidson Trauma Scale (DTS; to assess PTSD symptoms), and the Combat Exposure Scale (CES; to assess a participants extent and intensity of exposure to combat). Logistic regressions were conducted to assess whether being diagnosed with MDD or AUD along with a PTSD diagnosis were related to an increased risk of suicidality (defined by the authors as a score of 3 or greater on the BSS/SSI-A) after controlling for the effect of demographic variables, combat exposure, and a history of suicide attempts.

Scientific Quality: *Peer reviewed. The measures used by the authors (both clinically administered and self-report) had excellent psychometric properties. The sample was large enough to reliably analyze and was drawn from an appropriate population. The authors chose to conduct a logistic regression which meant that they used an absolute cutoff for suicidality (score of 3 or greater), however, a multiple regression may have shown different results and would have been another valid way of analyzing the data. The authors changed the measure of suicidal ideation partway through data collection, but did not do any kind of analysis to show that the results that they obtained were equivalent across the two measures. Medium to high.*

Core Findings: Having both a diagnosis of PTSD and depression did not significantly increase the risk of being suicidal over and above the risk of PTSD alone (though there was a trend in that direction). Having a diagnosis of an alcohol disorder as well as PTSD did not increase the risk of suicidality over having a diagnosis of PTSD alone. The PTSD symptoms that were most closely associated with suicidality were the numbing symptoms (e.g., feelings of detachment from others, a restricted range of affect). They also found that, after controlling for these previous suicide attempts and combat exposure, both PTSD alone and depression alone were associated with an increased risk of suicidality. Not surprisingly, the authors found that having a history of a suicide attempt increased one's risk of suicidality as did a greater level of exposure to combat.

**Type of Sample/
Emergency
Responder:**
Military

Relevance: This research shows that a diagnosis of PTSD (even without a diagnosis of depression or alcohol abuse) significantly increases the risk of suicidal ideation (which has been shown to reliably predict an increased risk for suicide attempts). Full treatment for PTSD within the first responder/receiver community should consider the risk for suicide (i.e., the potential for suicidal ideation and self-harm) even in the absence of a depression or alcohol abuse diagnosis.

2.14 Many factors linked with PTSD (e.g., childhood adversity, preparedness, number of traumas faced)

<p>Full Reference: IVERSON, A. C., FEAR, N. T., EHLERS, A., HACKER HUGHES, J., HULL, L., EARNSHAW, M., GREENBERG, N., RONA, R., WESSELY, S., & HOTOPF, M. 2008. Risk factors for post-traumatic stress disorder among UK Armed Forces personnel. <i>Psychological Medicine</i>, 38, 511-522.</p>	
<p>Purpose of the Study: The authors aimed to identify the relative contributions to the prevalence of PTSD of several variables including demographics, childhood adversity, the nature of exposure to traumatic events during deployment, appraisal of these experiences, and home-coming experiences.</p>	
<p>Method/Measures: The authors had 4762 Iraq War veterans complete a 26-page questionnaire booklet that covered (among other things not relevant to this particular paper), background information including past medical history and adversity in childhood, information on current health, experiences on deployment (e.g., information on their main duty in theatre, their length of service in a "forward" area, potentially traumatic experiences, comradeship within their unit, etc.), and experiences following deployment (e.g., decompression, receipt of a home-coming brief, feelings of pride in their contribution while deployed, etc.). Symptoms of PTSD were measured using the 17-item National Center for PTSD Checklist with scores ≥ 50 indicating a diagnosis of PTSD.</p>	
<p>Scientific Quality: <i>Peer reviewed. Objectives were well described, sizable participant pool was included. Because the survey was used in multiple studies, it was not well-described in this particular paper (e.g., no psychometric properties discussed). Statistical methodology was appropriate, though some justification for why some things were tested while others were not was not provided. Appropriate tables were used to present the results. Conclusions were supported by the results described. Medium to high quality.</i></p>	
<p>Core Findings: The findings indicate that PTSD is more prevalent among lower ranks, those who are single or divorced/separated, have less education and those who have a history of adversity in childhood. More negative assessments of one's deployment experiences, especially with regard to threat to one's life and not being prepared for their work in theatre, increased the odds of developing PTSD. Post-deployment variables that increased one's likelihood of developing PTSD included low morale, perceived disinterest by superiors and not getting a home-coming brief. When all of these variables were considered in a single model, childhood adversity, time spent in a forward area, low perceived preparedness for work in theatre, perceived threat to life, number of traumas involving others, and lower morale remained significant predictors of PTSD.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: Two key findings from this study are particularly relevant to first responders/receivers. First, the finding that low perceived preparedness for work in theatre is related to a significant increase in the probability of experiencing PTSD is relevant. If an individual is not properly trained for their position, they are likely to feel less control over the situation, which has been linked in past research to increased PTSD symptomatology. Further, lower morale and its relationship to comradeship and therefore a support system was related to a lower probability of a diagnosis of PTSD. Having a core group of supporters, especially those who can understand the issues that one is dealing with, can help buffer against the adverse effects of traumatic events and decrease the probability that one will develop PTSD.</p>

2.15 Burnout linked with increased PTSD

<p>Full Reference: LAFAUCI SCHUTT, J.M., & MAROTTA, S.A. 2011. Personal and environmental predictors of posttraumatic stress in emergency management professionals. <i>Psychological Trauma: Theory, Research, Practice, and Policy</i>, 3, 8 – 15.</p>	
<p>Purpose of the Study: To explain how personality traits and role issues (e.g., trauma exposure, burnout, compassion satisfaction) predict PTSD symptoms in emergency management professionals.</p>	
<p>Method/Measures: Participants ($n = 197$) were emergency management professionals completed an on-line survey, which included measures of personality (neuroticism, extraversion), frequency of trauma exposure, repeated exposure symptomology (burnout, compassion satisfaction), ethnic identity, and PTSD. Correlations and hierarchical regressions were performed.</p>	
<p>Scientific Quality: <i>Peer reviewed. Used large sample size, and scientifically sound statistical methods. High quality.</i></p>	
<p>Core Findings: Personality, frequency of trauma exposure, and repeated exposure symptomology explained 41% of the variance in PTSD symptoms. Specifically, neuroticism, burnout and compassion satisfaction were positive predictors of PTSD. However, compassion satisfaction and extraversion were both significant negative predictors of PTSD symptoms when conducting correlation analyses. In addition, trauma exposure was not a significant predictor of PTSD symptoms in correlational analyses.</p>	
<p>Type of Sample/ Emergency Responder: Emergency management professionals</p>	<p>Relevance: The findings from this study suggest that neuroticism and burnout could be PTSD risk factors for first responders/receivers.</p>



2.16 No difference in PTSD rates among female/male police officers

<p>Full Reference: LILLY, M.M., POLE, N., BEST, S.R., METZLER, T., &MARMAR, C.R. 2009. Gender and PTSD: What can we learn from female police officers? <i>Journal of Anxiety Disorders</i>, 23, 767-774.</p>	
<p>Purpose of the Study: The authors investigate the potential roots of differences between civilian and police populations in the prevalence rates for PTSD among females. Past research has shown a greater prevalence of PTSD among females vs. males in the general population, however, this gender discrepancy has not been found in the police population. One hypothesis is that female police officers react to trauma in a more “masculine” way thus reducing their immediate emotional distress as a result of exposure to a traumatic incident and reducing their subsequent risk for PTSD.</p>	
<p>Method/Measures: The authors surveyed 157 female police officers and 124 female civilians with regard to their history of trauma exposure (Trauma History Questionnaire and Worst Traumatic Event), as well as their tendency to self-report in ways that elicit approval from others (Social Desirability Scale), their emotional distress during and immediately after the traumatic event (Peritraumatic Distress Inventory), their dissociation during and immediately after the traumatic event (Peritraumatic Dissociative Experiences Questionnaire), their coping strategies when dealing with the traumatic event (Ways of Coping Questionnaire), their social support network (Sources of Support), somatization (Somatization Subscale of the Symptom Checklist-90-Revised), and their PTSD symptomology (Mississippi Scale). The psychometric properties of these scales ranged from good to excellent.</p>	
<p>Scientific Quality: <i>Peer reviewed. Study was well described, sample was a good size and was drawn from an appropriate population, measures used had good psychometric properties that were well described, analysis was appropriate, controlled for potentially confounding variables, conclusions were supported by the results. High quality</i></p>	
<p>Core Findings: While female police officers reported being exposed to a greater number of traumatic events than their civilian counterparts, they reported less peritraumatic dissociation, peritraumatic emotional distress, and less severe PTSD symptoms. Mediation regression analyses indicated that the differences in PTSD symptom severity between the two groups could be accounted for by the greater peritraumatic emotional distress evidenced by the female civilians as compared to the female police officers. However, peritraumatic emotional distress was more strongly related to somatic symptoms such as faintness/dizziness; pain in the heart, chest, or lower back; nausea; and muscle soreness, among female police officers than their civilian counterparts.</p>	
<p>Type of Sample/ Emergency Responder: Police</p>	<p>Relevance: Because women tend to express the emotions of fear, anxiety, and helplessness more intensely than men, they are more susceptible to developing PTSD symptoms as a result of a traumatic incident. However, the finding that female police officers experience PTSD at similar levels to their male counterparts indicates that this emotional link is not biologically determined. A reduced peritraumatic emotional reaction to a traumatic event is likely to reduce the likelihood that an individual will develop PTSD symptoms.</p>

2.17 Police officers have typical PTSD rates, but dissociation during trauma predicts higher rates

<p>Full Reference: MARCHAND, A., BOYER, R., NADEAU, C., & MARTIN, M. 2013. Predictors of posttraumatic stress disorders in police officers. Report R-786. Montreal, PQ: IRSST Studies and Research Projects.</p>	
<p>Purpose of the Study: To assess the pre-, peri- and posttraumatic factors that impact on the development of PTSD and police officers' ability to cope with traumatic events.</p>	
<p>Method/Measures: Marchand et al. conducted two studies. In Study 1, Quebec police officers ($n = 83$) who had experienced a major traumatic event were assessed for PTSD symptoms and PTSD factors (pre-, peri-, posttraumatic), using semi-structured interviews and self-report surveys, within 2 weeks, 1 month, 3 months, and 12 months of the event. Data was analyzed by first identifying the best predictors of PTSD using correlations and then entering significant predictors into a regression model for Time 2, Time 3, and Time 4. In Study 2, Montreal police officers ($n = 169$) completed an interview and a survey to determine whether or not they were suffering from PTSD and to evaluate PTSD predictors. Multivariate statistics were used identify predictors of PTSD and their impact on PTSD development.</p>	
<p>Scientific Quality: <i>This version of the report was not peer reviewed, but other versions have been. Strong methodological approach, but the sample size was a bit small to conduct multivariate linear regression. Medium – high quality.</i></p>	
<p>Core Findings: Study 1. Prevalence rates of PTSD. Prior to the traumatic event for which they were taking part in the study, 7% of participants had previously experienced clinical PTSD. At T1 of the study, 9% met criteria for clinical acute stress disorder. At T2 of the study, 3% were diagnosed with PTSD and 9% with partial PTSD. At T3 and T4 of the study, 4% were diagnosed with partial PTSD.</p> <p>Predictors of PTSD. Several risk factors that predict PTSD were identified. These includes emotional strategies for coping with stress (pre-traumatic); physical and emotional reaction, dissociation (peri-traumatic); acute stress disorder symptoms and depression symptoms at T1, negative media coverage, lack of consultation with an assistance program, level of positive support, and levels of criticism from superiors, peers, or themselves (post-traumatic).</p> <p>Study 2. 7.6% of the officers had been diagnosed with clinical PTSD related to a traumatic incident at some time in their career. PTSD risk factors identified were physical and emotional reactions, dissociation during and immediately after a traumatic event (peri-traumatic). PTSD protective factors identified were being hardy (pre-traumatic), perceived and actual coworkers social support during and after event (peri- and posttraumatic).</p>	
<p>Type of Sample/ Emergency Responder: Police</p>	<p>Relevance: These findings suggest that police officers do not have higher rates of PTSD than the general population. For those who do develop PTSD, the greatest risk factors appear to be officers' physical and emotional reactions during a traumatic event, as well as showing signs of dissociation. Also, perceived and actual positive support from coworkers both during and after a traumatic event may help officers to avoid or lessen the severity of PTSD.</p>



2.18 Police officers' dissociation linked with higher PTSD, supportive recovery environment linked with lower PTSD

<p>Full Reference: MARMAR, C.R., MCCASLIN, S.E., METZLER, T.J., BEST, S., WEISS, D.S., FAGAN, J., LIBERMAN, A., POLE, N., OTTE, C., YEHUDA, R., MOHR, D., & NEYLAN, T. 2006. Predictors of posttraumatic stress in police and other first responders. <i>Annals of the New York Academy of Sciences</i>, 1071, 1 – 18.</p>	
<p>Purpose of the Study: Marmar et al. (2006) propose a conceptual model for the development of PTSD symptoms in police and first responders.</p>	
<p>Method/Measures: Building on their previous research, the authors developed and tested a complex model of many possible predictors of PTSD symptoms on a sample of New York and Bay Area police officers ($n = 747$).</p>	
<p>Scientific Quality: <i>Peer-reviewed. Large sample size, but there were few conclusions and the methods were not described in detail. Medium quality.</i></p>	
<p>Core Findings: The factors entered into the model accounted for a significant proportion (39.7% of the variance) of PTSD symptoms. The five significantly influential factors were peri-traumatic distress (i.e., distress experienced during and immediately after a traumatic event), peri-traumatic dissociation (i.e., dissociation experienced during and immediately after a traumatic event), greater problem-solving coping, greater routine work environment stress, and lower levels of social support.</p>	
<p>Type of Sample/ Emergency Responder: Police Paramedics</p>	<p>Relevance: Findings from this study highlight risk and resilience factors for police officers. Specifically, the findings indicate that officers' peri-traumatic reactivity (i.e., distress and dissociation at the time of the incident) and post-incident recovery environments (i.e., level of social supports and routine work environment stress) impact PTSD symptoms. Results also indicate that active coping strategies do not protect first responders and officers against PTSD symptoms.</p>

2.19 Incurring physical injury linked with increased PTSD

<p>Full Reference: MACGREGOR, A.J., CORSON, K.S., LARSON, G.E., SHAFFER, R.A., DOUGHERTY, A.L., GALARNEAU, M.R., RAMAN, R., BAKER, D.G., LINDSAY, S.P., & GOLOMB, B.A. 2009. Injury-specific predictors of posttraumatic stress disorder. <i>Injury</i>, 40, 1004 - 1010.</p>	
<p>Purpose of the Study: To characterize the relationship between injury-related factors and PTSD for military personnel injured in battle.</p>	
<p>Method/Measures: Medical data for American Iraq combatants injured during battle between September 2004 and February 2005 (n = 831) was reviewed through to November 2006 for diagnosis of PTSD or any mental health outcome. Variables included heart rate, diastolic and systolic blood pressure, severity of injury (e.g., minor, severe), injury mechanism (e.g., improvised explosion device, gunshot wound), facial injury. Logistic regression modeling was used to test relationships between variables.</p>	
<p>Scientific Quality: Peer reviewed. Used a large sample size, and scientifically-sound statistical methods. High quality.</p>	
<p>Core Findings: Only serious injuries and severe injuries were significantly related to diagnosis of PTSD. Moderate injuries, serious injuries, severe injuries, and gunshot wounds were significantly related to a diagnosis of any mental health outcome.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: The results of this study suggest injury severity is a risk factor for first responders/receivers developing PTSD. Specifically first responders/receivers who are seriously or severely injured during a traumatic event are more likely to develop PTSD symptoms than those who receive minor or moderate injuries.</p>



2.20 PTSD linked with burnout in nurses

<p>Full Reference: MEALER, M., BURNHAM, E. L., GOODE, C. J., ROTHBAUM, B., & MOSS, M. 2009. The prevalence and impact of post-traumatic stress disorder and burnout syndrome in nurses. <i>Depression and Anxiety</i>, 26, 1118-1126.</p>	
<p>Purpose of the Study: To examine how common PTSD and burnout syndrome (BOS) are in nurses and whether they co-occur with altered perceptions of work and non-work-related activities.</p>	
<p>Method/Measures: Questionnaires were distributed to nurses through managers. Measures included the Hospital Anxiety and Depression Scale (HADS), the PTSS-10 to detect PTSD, the Posttraumatic Diagnostic Scale (PDS), and the Maslach Burnout Inventory to detect burnout syndrome (BOS). Completed surveys were sealed and placed in a designated collection bin.</p>	
<p>Scientific Quality: <i>Peer-reviewed. Self-reporting survey; compared three different groups with PTSD and/or BOS; good sample size, but self-selecting and homogenous; did not consider history of trauma = medium quality.</i></p>	
<p>Core Findings: Almost all of the nurses who met the diagnostic criteria for PTSD (98%) were also positive for BOS. This combination impacted perceptions of work and non-work activities. Nurses who had both PTSD and BOS had negative opinions regarding teamwork and confidence about the nurses and doctors with whom they worked. Nurses who reported PTSD as well as BOS symptoms were significantly more likely to report have difficulties in their personal lives compared to those who only expressed BOS symptoms. That is, work interfered with their ability to fulfill household duties, participation in leisure, relationships with their family, sex life, general satisfaction with life, and overall functioning in their life. End of life issues for nurses seem to be a trigger for PTSD symptoms, such as nightmares and anxiety.</p>	
<p>Type of Sample/ Emergency Responder: Nurses</p>	<p>Relevance: The combination of BOS and PTSD may have a negative impact on work and non-work related functioning. Confronting traumatic experiences as well as the general demands of the job may place first responders at a risk of developing both PTSD and BOS.</p>

2.21 PTSD rates lower in firefighters than public – high work stress and low social support (but not trauma exposure) predict PTSD

<p>Full Reference: MEYER, E.C., ZIMERING, R., DALY, E., KNIGHT, J., KAMHOLZ, B.W., & BIRD GULLIVER, S. 2012. Predictors of posttraumatic stress disorder and other psychological symptoms in trauma-exposed firefighters. <i>Psychological Services</i>, 9, 1-15.</p>	
<p>Purpose of the Study: To examine the rate of PTSD among experienced professional firefighters and to examine predictors of PTSD symptom severity.</p>	
<p>Method/Measures: Active firefighters (n = 142) in a large urban fire department who had been exposed to potentially traumatic events completed self-report questionnaires and a structured clinical interview with a psychologist. Measures included PTSD symptoms, traumatic events, depression, anxiety, alcohol abuse, social support, occupational stressors, coping strategies. Analyses examined the most influential predictors of psychological symptoms.</p>	
<p>Scientific Quality: Peer reviewed. Used a large sample size, and included clinical assessment for PTSD. High quality.</p>	
<p>Core Findings: Six participants (4.2%) met Clinician-Administered PTSD Scale (CAPS) criteria for current PTSD, and five (3.5%) met them for a lifetime, but not current, diagnosis. These PTSD rates are lower than those for the general public. Lower perceived social support and higher occupational stress were risk factors for PTSD symptoms, but the number of critical incidents (i.e., trauma exposure) was not. Coping through self-blame and substance use was associated with higher PTSD symptom levels.</p>	
<p>Type of Sample/ Emergency Responder: Firefighters</p>	<p>Relevance: This study showed that firefighters had lower PTSD rates than the general public, which may be due to screening procedures. PTSD risk factors for firefighters include feeling high levels of stress on the job and not feeling socially supported. Interestingly, the number of critical incidents attended by firefighters was not identified as a risk factor for PTSD.</p>



2.22 High social support linked with decreased PTSD and suicide risk

<p>Full Reference: NELSON, C., ST. CYR, K., CORBETT, B., HURLEY, E., GIFFORD, S., ELHAI, J.D., & RICHARDSON, J.D. 2011. Predictors of posttraumatic stress disorder, depression, and suicidal ideation among Canadian Forces personnel in a National Canadian Military Health Survey, <i>Journal of Psychiatric Research</i>, 45. 1483-1488.</p>	
<p>Purpose of the Study: The authors aimed to determine the relations between social support, religiosity, and number of lifetime traumatic events experienced on PTSD, depression, and suicidal ideation.</p>	
<p>Method/Measures: The sample of 8441 active Canadian Forces participants was drawn from the Canadian Community Health Survey – Canadian Forces Supplement (CCHS-CFS) using face-to-face interviews. A single item was used to measure religiosity. Social support was measured using the Medical Outcomes Survey (MOS) Support Survey, which is a 19 item scale with subsections that measure affection, emotional or informational support, positive social interaction, and tangible support. The World Mental Health version of the Composite International Diagnostic Interview was used to determine the number of lifetime traumatic events experienced, as well as past-year experiences of PTSD, MDD, alcohol dependence and suicidal ideation. All of the measures used had excellent psychometric properties. Structural equation modeling was used to fit a model to the data that predicted suicidal ideation within the past 12 months.</p>	
<p>Scientific Quality: <i>Peer Reviewed. The objective of the paper was clearly stated. The sample chosen was representative of the target population and was adequately large for the statistical tests used in the paper. The statistical analyses were appropriate for the aims of the study. Most of the conclusions drawn were supported by the statistical analyses, however, there were other hypothesized pathways in the model that were not supported and not addressed in their conclusions. Other pathways that would have been enlightening (such as the relationship between MDD and PTSD) were left out of the model altogether. Finally, the authors make a statement that past-year diagnosis of PTSD is a significant predictor of suicidal ideation, however, this is not supported by the results of their model. Medium quality.</i></p>	
<p>Core Findings: Self-perceived religiosity was associated with an increase in MDD. A history of traumatic events was shown to increase an individual's likelihood of developing MDD, PTSD, and alcohol dependence and also increase the likelihood that they will contemplate or attempt suicide. Increased social support greatly decreased the chances of developing PTSD, MDD, alcohol dependence or contemplating or attempting suicide.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: A strong social support network within the first responder/receiver community is the first, best way to buffer against the negative psychological implications of experienced trauma.</p>

2.23 Physical pain during trauma increases PTSD risk

<p>Full Reference: NORMAN, S.B., STEIN, M.B., DIMSDALE, J.E., & HOYT, D.B. 2008. Pain in the aftermath of trauma is a risk factor for post-traumatic stress disorder. <i>Psychological Medicine</i>, 38, p. 533-542.</p>	
<p>Purpose of the Study: Determine if 1) pain experienced at the time of a traumatic injury could be a risk factor PTSD, given that pain and PTSD share neurobiological pathways, and 2) pain would be a proxy measure for later pain that acts as a reminder of the trauma and its severity.</p>	
<p>Method/Measures: Participants were men and women admitted to the University of California San Diego Surgical Trauma Center. Participants completed assessments at 1-, 4- and 8-month intervals. Measures included a peritraumatic pain questionnaire (McGill Pain Questionnaire – Short Form) within 24-48 hours post-trauma (e.g., motor accidents, burns, falls, stabbings, assault, etc.). Other measures just following the trauma included past psychiatric history, perceived life threat, emotional experience at the time of trauma, and trauma severity. At 1-month post-trauma, participants underwent an Acute Stress Disorder Structured Interview and their previous trauma history was assessed (Life Events Checklist). At 4 and 8 months, PTSD was assessed using the diagnostic interview method (Composite International Diagnostic Interview).</p>	
<p>Scientific Quality: <i>Peer-reviewed; multiple methods and measures; mixed gender sample, but small and self-selected; strong analysis = medium quality.</i></p>	
<p>Core Findings: Pain following a traumatic injury was shown to increase the risk for PTSD. Specifically, increased pain ratings showed five times increased likeliness of PTSD after 4 months of the traumatic injury and seven times increased likeliness after 8 months. Females were more likely to develop PTSD than males. The notion that peritraumatic pain is a risk factor because later pain acts as a reminder of the trauma and a cue for PTSD symptoms was not supported.</p>	
<p>Relevance to First Responders/Receivers: First responders should be made aware that those who suffer a traumatic injury are at risk for PTSD. But this risk is not because later pain acts as a reminder and cues the symptoms. Instead, it is argued that memories encoded during the pain are easily retrievable and strongly recounted and thus may contribute to the PTSD symptoms. Aggressive treatment of pain (pharmacological or psychological) might lessen the strong encoding that arises as a result of trauma, and this may mitigate future PTSD symptoms.</p>	
<p>Type of Sample/ Emergency Responder: N/a</p>	<p>Relevance: A strong social support network within the first responder/receiver community is the first, best way to buffer against the negative psychological implications of experienced trauma.</p>



2.24 Physical injury and atypical roles linked with higher PTSD

<p>Full Reference: PERRIN, M.A., DIGRANDE, L., WHEELER, K., THORPE, L., FARFEL, M., & BRACKBILL, R. 2007. Differences in PTSD prevalence and associated risk factors among World Trade Center disaster rescue and recovery workers. <i>American Journal of Psychiatry</i>, 164, 1385-1394.</p>	
<p>Purpose of the Study: Perrin et al. (2007) investigated prevalence and predictors of PTSD among various types of disaster workers (e.g., police, construction workers, volunteers with no prior disaster experience, etc.) following the attacks of 9/11. They hypothesized that personnel with less disaster experience and training and that personnel who performed a different role than their usual occupation would be at higher risk for developing PTSD 2-3 years later.</p>	
<p>Method/Measures: A large sample of data on disaster workers (N = 28,692) from the World Trade Center Health Registry was collected. Enrollment and baseline interviews began in September 2003. Workers were categorized into the following: police, firefighter, emergency medical services (EMS), construction/engineering, sanitation, agency volunteer, unaffiliated volunteer and other government agency. PTSD was assessed using the PTSD Checklist-Civilian Version.</p>	
<p>Scientific Quality: Peer reviewed. Large sample from reliable source; sample groups roughly equal in size, and compared on a single disaster. Missing responses are accounted for and tested. Method and analysis thoroughly explained. Quality = high.</p>	
<p>Core Findings: The prevalence of PTSD among all workers was 12.4%, with police having the lowest (6.2%) and non-agency volunteers yielding the highest (21.2%). When controlling for demographics and disaster experience, prevalence increased in sanitation workers and agency volunteers. Sustaining an injury was the strongest risk factor (compared to witnessing an injury or death, seeing the planes crash into the towers, dust cloud exposure, etc.) for all occupations. Personnel who performed tasks that were very different from their usual occupation (e.g., non-firefighters working as firefighters) were at greatest risk.</p>	
<p>Type of Sample/ Emergency Responder: Police Firefighters Emergency medical services Disaster recovery workers</p>	<p>Relevance: This study suggests the importance of first responders performing the occupation for which they are trained (e.g., EMS performing EMS-related tasks, firefighters fighting fires). Police were found to be the least at-risk for PTSD among first responders; however, it is important to note that significantly fewer police were lost compared to firefighters.</p>

2.25 Women more likely to develop PTSD than men¹

<p>Full Reference: TOLIN, D. F. & FOA, E. B. 2008. Sex differences in trauma and posttraumatic stress disorder: A quantitative review of 25 years of research. <i>Psychological Trauma: Theory, Research, Practice, and Policy</i>, S, 37-85.</p>	
<p>Purpose of the Study: The study is a meta-analytic review investigating the differences between males and females who experience or are at risk for PTSD, with a focus on potentially traumatic events (PTEs).</p>	
<p>Method/Measures: Tolin and Foa (2008) investigated literature from 1980 through July 2005 on the prevalence of PTEs and severity of PTSD among males and females. Their initial search yielded 2477 articles, but their exclusion criteria brought the final number of articles left for analysis down to 290. They used Comprehensive Meta-Analysis software to calculate Cohen's d, weighted effect sizes by sample size, and assigned effect size estimates by sex (i.e., positive effect sizes represented greater PTSD prevalence among females while negative effect sizes represented greater prevalence among males).</p>	
<p>Scientific Quality: <i>Peer-reviewed. Medium to high. This study is thorough in its explanations of aim, methodology, and analysis, yet, like any meta-analysis, depends on the validity of the studies it examines.</i></p>	
<p>Core Findings: Previous studies suggest that females are at greater risk for PTSD than their male counterparts. The current study found that females are nearly twice as likely to meet criteria for PTSD diagnosis compared to males, despite the fact that males were found to be significantly more likely to experience a traumatic event overall. However, specific types of PTEs yielded sex differences as well, such as females being significantly more likely to experience sexual assault and males significantly more likely to experience PTEs in the form of witnessing death or injury, disaster or fire. Most sex differences were significant even when controlling for type of traumatic event. The researchers suggest that a disproportionate number of PTEs in the form of child and adult sexual assault may be a strong predictor for PTSD in females.</p>	
<p>Type of Sample/ Emergency Responder: N/a</p>	<p>Relevance: The findings of the current study strongly suggest that female first responders may be at greater risk of experiencing PTSD compared to their male counterparts. The finding that males are more likely to experience PTEs in less noteworthy, given that first responders, both male and female, are exposed to various types of PTEs on a frequent basis.</p>

¹But see Section XX for another perspective.

2.26 Sub-threshold PTSD linked with depression, alcohol, poor health

<p>Full Reference: YARVIS, J. S. & SCHIESS, L. 2008. Sub-threshold posttraumatic stress disorder (PTSD) as a predictor of depression, alcohol use, and health problems in veterans. <i>Journal of Workplace Behavioral Health</i>, 23, 395-424.</p>	
<p>Purpose of the Study: Yarvis and Schiess (2008) compared classic PTSD with subclinical or sub-threshold PTSD, characterized by experiencing at least one symptom in each symptom category of the classic PTSD diagnosis in the DMS-IV (Stein et al., 1997). The difficulty of diagnosing subclinical PTSD is complicated by comorbidities with depression, alcohol abuse, and overall poor health. Differences in veterans diagnosed with classic, subclinical, and absent PTSD and comorbidity rates among veterans were explored. The primary concern is that subclinical PTSD is likely more prevalent than realized, suggesting that many war veterans could fail to receive necessary PTSD treatment.</p>	
<p>Method/Measures: A questionnaire was distributed to 1,968 (94% male) Canadian Forces soldiers in 1999, via the Veterans' Care Needs Project under Veterans Affairs Canada (VAC). Demographic information was obtained using the Veterans Care Needs Survey. In addition to a general health questionnaire, PTSD and psychiatric morbidities were measured using Posttraumatic Stress Disorder Checklist – Military Version (PLC-M, Weathers et al., 1993), the Center for Epidemiological Studies – Depression Scale (CES-D; Radloff, 1977), the Alcohol Use Disorders Identification Test (AUDIT; Babor et al., 1992). Results were analyzed using logistic regression analyses.</p>	
<p>Scientific Quality: Peer-reviewed. Detailed explanation of the method used in creating and analyzing their extensive model. However, all measures depend on self-report and although a good size, the sample was disproportionately male. Quality = medium.</p>	
<p>Core Findings: Results showed that veterans with classic PTSD had much higher comorbidity rates with alcohol abuse and depression than did their subclinical PTSD counterparts. Veterans with subclinical depression are at equal risk for overall poor health as those who suffer with classic PTSD, but were more likely to be alcoholic than those with classic PTSD. It was also found that personnel who are female, unmarried, and/or have been deployed are at overall greater risk for PTSD.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: There was no direct link in this article to first responders. However, the data suggest that subclinical PTSD can carry risk factors for alcohol abuse, depression, and poor health, like with classic PTSD. The study further supports that females are at greater risk for PTSD. Going forward, it would be ideal to investigate the prevalence of subclinical PTSD in first responders.</p>

2.27 Both mental and physical status should be used to diagnose PTSD

<p>Full Reference: SMITH, T.C., WINGARD, D.L., RYAN, M.A.K., KRITZ-SILVERSTEIN, D., SLYMEN, D.J., & SALLIS, J.F. 2009. PTSD prevalence, associated exposures, and functional health outcomes in a large, population-based military cohort. <i>Public Health Reports</i>, 124, 90-102.</p>	
<p>Purpose of the Study: To explore self-reported exposures to chemical and biological agents independent of combat exposure, the prevalence of PTSD symptoms and diagnosis, and functional health in U.S. military personnel.</p>	
<p>Method/Measures: This study used baseline Millennium Cohort data (July 2001 to June 2003) of 75,156 U.S. military members, a longitudinal study of military personnel health. They used a PTSD checklist (PTSD Checklist-Civilian Version) to identify those suffering from its symptoms (intrusion, avoidance, and hyperarousal items) as well as asking participants if they had ever been diagnosed as a person with PTSD by a health provider. Functional health was measured the Medical Outcomes Study Short Form 36-Item Health Survey for Veterans, which measures both physical and mental health. Participants self-reported exposure to chemical biological warfare and countermeasures (example donning/doffing chem/bio gear and responding to alarms) by answering “yes” “no” and the number of times. These exposures were kept separate to other combat exposure. Finally, alcohol and cigarette use were assessed.</p>	
<p>Scientific Quality: <i>Self-reported survey; standard instruments allowed comparison to other populations; large sample size, but self-selecting = low – medium quality</i></p>	
<p>Core Findings: Those individuals who self-reported exposure to chemical biological warfare, protective countermeasures, or warning alarms associated with chemical biological agents was significantly related to a PTSD diagnosis and current PTSD symptoms independent of combat-related stresses (such as witnessing death, torture, rape, etc.). Decreased mental and physical health was associated with current PTSD symptoms. Those who reported a PTSD diagnosis but did not show PTSD symptoms had similar mental and physical health as the general cohort. For those who reported current PTSD symptoms, they showed low mental functioning despite being physically fit for duty, suggesting a need to screen more effectively for undiagnosed PTSD symptoms.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: People with undiagnosed PTSD symptoms may be physically fit for duty, but this fitness could mask (either intentionally or unintentionally) their diminished mental health. Measures to diagnose PTSD must be effective for various cohorts like first responders who will witness trauma but whose role requires them to cope effectively in traumatic situations.</p>



2.28 Death or injury to loved ones or colleagues most predictive of PTSD in nurses and ambulance personnel

<p>Full Reference: DECLERCQ, F., MEGANCK, R., DEHEEGHER, J., & VAN HOORDE, H. 2011. Frequency of and subjective response to critical incidents in the prediction of PTSD in emergency personnel. <i>Journal of Traumatic Stress</i>, 24, 133-136.</p>	
<p>Purpose of the Study: Declercq et al. investigated exposure frequency and severity of incident in PTSD prediction among nurses and ambulance personnel in military settings. A big focus of the study was comparing the differences between participants' subjective ratings of trauma exposure, using DSM-IV definitions (e.g., fear, helpless, and horror).</p>	
<p>Method/Measures: Data were obtained through self-report questionnaires from 136 nurses and ambulance drivers from Belgian Defence; most personnel in the sample were ambulance drivers (60%) and 76% of the sample was male. Trauma exposure was measured using a Likert-type scale based on archival data and literature, while PTSD was measured using the Davidson Trauma Scale (DTS; Davidson et al., 1997).</p>	
<p>Scientific Quality: Peer reviewed. Sample size is acceptable, although there is not an even divide between genders or occupation type. Reliability not discussed. Simple explanation of analysis. Research discussion overall is relatively short. Quality = medium.</p>	
<p>Core Findings: Personnel reported have been exposed to an average of about 15 critical incidents. They rated the average subjective impact of these incidents as 1.75 out of 5, representing their perception that it had a slight impact on them. Frequency of exposure was positively related to PTSD symptoms of intrusion, hyper-arousal, numbing, and avoidance. Of the many critical incidents reported by personnel, the most problematic types involved death or injury to loved ones or colleagues and witnessing aftermath of child sexual abuse. The findings support that experiencing fear, helplessness, or horror in relation to a traumatic event is predictive of PTSD, especially symptoms of intrusion and hyper-arousal. Unlike similar studies, the current study found no evidence that exposure frequency is related to risk of PTSD.</p>	
<p>Type of Sample/ Emergency Responder: Nurses (Military) Ambulance personnel</p>	<p>Relevance: The current study sheds light on which critical incidents are most salient to first responders (nurses and ambulance drivers in particular). Similar to findings with firefighters and police, the researchers found that death of or serious harm to known individuals or children are the most traumatizing of events. The study also supports the importance of considering subjective ratings of trauma when diagnosing PTSD.</p>

2.29 Partial and full PTSD in Brazilian ambulance workers

<p>Full Reference: BERGER, W., FIGUEIRA, I., MAURAT, A.M., BUCASSIO, E.P., VIEIRA, I., JARDIM, S.R., COUTINHO, E.S.F., MARI, J.J., & MENDLOWICZ, M.V. 2007. Partial and full PTSD in Brazilian ambulance workers: Prevalence and impact on health and on quality of life. <i>Journal of Traumatic Stress</i>, 20, 637-642.</p>	
<p>Purpose of the Study: To determine the prevalence of posttraumatic stress symptoms in a sample of Brazilian rescue workers, and to compare groups with full and partial PTSD with a control group for indicators of psychosocial functioning, physical and mental health, and quality of life.</p>	
<p>Method/Measures: Ambulance workers in Rio de Janeiro (N = 234) completed a survey with measures of socio-demographics (e.g., physical and mental health), posttraumatic stress symptoms, and quality of life.</p>	
<p>Scientific Quality: <i>Peer-reviewed. The authors used established statistical methods but had a relatively small sample size. Quality = medium.</i></p>	
<p>Core Findings: 5.6% of the sample reported full PTSD scores and 15% reported partial PTSD scores. Full and partial PTSD was associated poorer quality of life with respect to general mental health than those without PTSD. Full PTSD was also associated with poorer quality of life with respect to physical health problems, vitality, and emotional problems.</p>	
<p>Type of Sample/ Emergency Responder: Ambulance workers (physicians, nurses, paramedics, technicians, driver)</p>	<p>Relevance: Ambulance workers with PTSD symptoms also report having lower quality of life in domains related to mental health, physical health, vitality, and emotional problems. As such, PTSD interventions may be more effective if they address these quality of life domains.</p>

3. Prevention of PTSD

3.1 Exposure to trauma increases chance of PTSD

<p>Full Reference: DE BOER, J., LOK, A., VAN'T VERLAAT, E., DUIVENVOORDENM, H. J., BAKKER, A. B., &SMIT, B. J. 2011. Work-related critical incidents in hospital-based health care providers and the risk of post-traumatic stress symptoms, anxiety, and depression: A meta-analysis. <i>Social Science & Medicine</i>, 73, 316-326.</p>	
<p>Purpose of the Study: To examine the impact of various work-related critical incidences (an unexpected event that has an emotional impact that overwhelms one's ability to cope) on hospital-based health care professionals' mental health. To examine varying effects of critical incidences on different groups of health care professionals.</p>	
<p>Method/Measures: Relevant online databases were searched for original research as well as manual searches of the Journal of Traumatic Stress, reference lists from relevant publications, and the European Traumatic Stress Research Database. Articles were included based on strict criteria. Meta-analysis was conducted using the random effects model.</p>	
<p>Scientific Quality: <i>Peer reviewed. Medium quality.</i></p>	
<p>Core Findings: Identified 11 studies that considered work-related critical incidences and PTSD symptoms, 6 of these also considered anxiety and depression. Studies differed considerably. They used a random effects procedure. Meta-analysis showed that critical incidents are positively related to PTSD symptoms. They found that the positive relationship with anxiety and depression did not hold in subgroup analysis, (i.e., based on different critical incidents). Some critical incidents showed the relationship whereas others did not.</p>	
<p>Type of Sample/ Emergency Responder: Nurses Doctors</p>	<p>Relevance: Critical incidents can lead to the development of PTSD symptoms, anxiety, and depression. Training and preparedness may help mitigate the negative influence of critical incidents as will raising awareness of the harmful long-term effects of critical incidents. Seeking help needs to be viewed as strength rather than a weakness of character and a reflection of one's coping skills. This is an act that demonstrates responsibility to one's self and those one is helping.</p>

3.2 Proper PTSD management requires organizational commitment

<p>Full Reference: ENGLISH, A. 2012. From combat stress to operational stress: The CF's mental health lessons learned from the "Decade of Darkness". Canadian Military Journal, 12, 9-17.</p>	
<p>Purpose of the Study: This article seeks to inform decision makers formulating policies around care for CAF veterans requiring treatment for Operational Stress Injury (OSI) in light of government funding cuts to defence and general perceptions about OSI.</p>	
<p>Method/Measures: Two models to explain how Canadians will perceive OSI are introduced, using lessons learned from the past to inform the discussion.</p>	
<p>Scientific Quality: Peer reviewed and written by knowledgeable military leader and historian.</p>	
<p>Core Findings: Support for those suffering from OSI is influenced by explanations for the cause, organizational and national culture, and the economic situation. Two models are considered to explain how Canadians will perceive OSI, the response cycle model and systems cycle model. The former has four phases: 1) "blissful ignorance", 2) awareness of the severity of the problem, 3) debate over how to address the problem, 4) implementing standardized procedures for dealing with the problem. The latter, based on an integrated personnel sustainment system, demands that senior leadership have continuous oversight over all aspects of the personnel system to make sure that all parts of the system are coordinated and not working at cross purposes. Core lessons learned with respect to PTSD or OSI are establishing a consensus regarding the definition of OSI quickly; OSIs are a systems issue; commanders are responsible for the health of their troops; and lessons must be constantly learned and disseminated.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: Ensure that PTSD is viewed as an integrated personnel sustainment system in order to identify and support those who might suffer from PTSD within the organization. Senior leadership must understand the impact these injuries have on both individuals and the system as a whole, thereby ensuring that those suffering are not personnel losses, but rather are maintained within the system.</p>



3.3 Stress inoculation training may help prevent PTSD

<p>Full Reference: HOURANI, L.L., COUNCIL, C.L., HUBAL, R.C., & STRANGE, L.B. 2011. Approaches to the primary prevention of posttraumatic stress disorder in the military: A review of the stress control literature. <i>Military Medicine</i>, 176, 721-730.</p>	
<p>Purpose of the Study: To conduct a review of literature pertaining to primary prevention efforts to stem the advent of PTSD and other combat and operational stress injuries in military populations.</p>	
<p>Method/Measures: Reviewed articles (n = 14) looking at prevention approaches with a nonclinical or non-referred sample prior to combat exposure and utilized a military population (American or British).</p>	
<p>Scientific Quality: <i>Peer reviewed. Only a small number of articles reviewed, due to the lack of published research in this area. Articles reviewed relied on anecdotal evidence and theoretical articles rather than research findings. In addition, few of the studies looked at PTSD, but rather associated symptoms such as psychological distress. Quality = low.</i></p>	
<p>Core Findings: The strongest strategies to date appear to be those utilizing a combination of education, skills training, and stress reduction techniques to enhance resilience. Specifically, stress inoculation training led to a reduction of physiological arousal shortly after trauma exposure, which may prevent or reduce the likelihood of developing psychological distress, including PTSD symptomatology. No evidence was found that a pre-deployment stress briefing reduces medium-term psychological distress.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: Stress inoculation training is designed to intervene to provide exposure people to minor stressors so that they will be more resilience to more major stressors. Providing first responders/receivers with stress inoculation training may help them to cope with stressful incident and subsequently reduce the risk of developing PTSD.</p>

3.4 PTSD levels common in different nurses, social support helps minimize onset of PTSD

<p>Full Reference: KERASIOTIS, B.& MOTTA, R.W. 2004. Assessment of PTSD symptoms in emergency room, intensive care unit, and general floor nurses. <i>International Journal of Emergency Mental Health</i>, 6, 121-133.</p>	
<p>Purpose of the Study: To determine whether emergency room nurses would score higher on PTSD, dissociative, anxiety and depression items compared to intensive care unit nurses and general medicine nurses. The impact of social support was also assessed.</p>	
<p>Method/Measures: Nurses received a package that contained the Modified Posttraumatic Symptom Scale Self-Report (MPSS-SR), Multidimensional Scale of Perceived Social Support (MSPSS), Peritraumatic Dissociative Experience Questionnaire (PDEQ), Beck Anxiety Inventory (BAI), and Beck Depression Inventory (BDI). Completed surveys were sealed and placed in a designated collection bin.</p>	
<p>Scientific Quality: <i>Peer-reviewed. Survey; good measures; self-selecting homogenous sample; low response from two of the three groups = medium quality</i></p>	
<p>Core Findings: There was no difference in PTSD levels for emergency room nurses compared to nurses in ICU or general floor nurses. General medicine and ER Nurses showed significantly higher levels of dissociation, which may be a way to cope with ongoing patient challenges and condition changes. All of the nurses in the study showed a high degree of anxiety, evidenced by fears of the worst happening, inability to relax, feeling terrified, nervousness, and light-headed. Correlations among depression, anxiety, dissociation and PTSD symptoms were also shown for the whole sample.</p>	
<p>Type of Sample/ Emergency Responder: Nurses</p>	<p>Relevance: Despite showing high levels of anxiety, working in highly stressful environments, nurses may benefit from the strong relationships they develop with patients and families who frequently recognize their efforts with gifts and other tokens of gratitude. Social support might help minimize the onset of PTSD symptoms when confronting traumatic situations.</p>



3.5 Clinical support found for collaborative care, extended outpatient therapy, and modified PE

<p>Full Reference: ORSELLO, C.A., & ALFONZO, C.A. 2012. Prevention of post-traumatic stress disorder among military health care workers: A systematic review. <i>Journal of Healthcare, Science and the Humanities</i>, 2, 17-29.</p>	
<p>Purpose of the Study: To conduct a literature review of the most effective strategies in the prevention of PTSD and consider their applicability to military healthcare providers.</p>	
<p>Method/Measures: Identified and reviewed peer-reviewed and evidence based articles published between 1998 and 2011. All articles reviewed involved preventive strategies with either direct or potential applicability to military healthcare workers.</p>	
<p>Scientific Quality: <i>Not peer-reviewed and the focus was on strategies related to military healthcare providers, a population facing stresses similar to those of some first responders/receiver, However, no information was provided as to the number of articles reviewed or the inclusion requirements. Medium quality.</i></p>	
<p>Core Findings: Results showed that the collaborative care approach, extended outpatient therapy, and modified prolonged exposure have clinical support as PTSD interventions. However, they argue that psycho-education, pre-deployment training, and early psychological intervention have less clinical support and advance their own preferred form of treatment.</p> <p>Risk factors for developing PTSD appear to be stressful life events after exposure, feeling of numbness after exposure, history of mental health disorders, lifetime trauma exposure, seeing others injured or killed, and little or no social support after traumatic event. Possible protection factors include resiliency, unit cohesion and physical exercise.</p>	
<p>Type of Sample/ Emergency Responder: Military health care workers</p>	<p>Relevance: The authors stress the importance of unit cohesion and physical exercise in protecting against PTSD symptoms. As such strategies to prevent PTSD symptoms in first responders/receivers may be more successful if they promote routine vigorous physical activity and unit cohesion. In addition, identify extended outpatient therapy, collaborative care approach, and modified prolonged exposure are interventions that may be effective for first responders/receivers who show PTSD symptoms.</p>

3.6 Good social supports linked with lower risk of PTSD

<p>Full Reference: PRATI, G., & PIETRANTONI, L. 2010. The relation of perceived and received social support to mental health among first responders: A meta-analytic review. <i>Journal of Community Psychology</i>, 38, 403-417.</p>	
<p>Purpose of the Study: To examine the role of received and perceived social support in promoting mental health among first responders.</p>	
<p>Method/Measures: The authors conducted a meta-analysis using studies (n = 36) published in peer-reviewed journals that focused on and provided an estimate of the relation between social support and mental health in first responders (i.e., paramedics, firefighters, police officers).</p>	
<p>Scientific Quality: <i>Peer reviewed. Provided a detailed description of methods. However, this article was not specific to PTSD. In addition social support and mental health were not defined. Medium quality.</i></p>	
<p>Core Findings: A moderate positive relationship ($r = 0.27$) was found between social support and mental health among first responders. Type of social support was the only significant moderator with the effect size for perceived social support being greater ($r = 0.31$) than for received social support ($r = 0.22$).</p>	
<p>Type of Sample/ Emergency Responder: Paramedics Firefighters Police</p>	<p>Relevance: The results from this study show a positive relationship between social support (especially perceived social support) and mental health in first responders/receivers. As such PTSD interventions should highlight the importance of social support and advocate methods that increase perceived social support for first responders exhibiting traumatic stress symptoms.</p>



3.7 High mission preparedness linked with lower risk of PTSD

<p>Full Reference: RENSHAW, K.D. 2011. An integrated model of risk and protective factors for post-deployment PTSD symptoms in OEF/OIF era combat veterans. <i>Journal of Affective Disorders</i>, 128, 321-326.</p>	
<p>Purpose of the Study: Renshaw (2011) investigated the impacts of combat experience, post-battle experience, and perceived threat to PTSD in a sample of military veterans once deployed to Afghanistan, and/or Iraq. One of the hypotheses was that minimal preparedness would be linked to greater risk of PTSD.</p>	
<p>Method/Measures: A total of 207 (98% male) military personnel with deployment experience were recruited; 72% completed their questionnaires within one year of returning from deployment. Four subscales were taken from the Deployment Risk and Resilience Inventory (DRRI; King et al., 2006): Preparedness subscale, Perceived Threat subscale, Combat Experience subscale, and Post-Battle subscale. PTSD was measured by the PTSD Checklist-Military Version (PCL-M; Weathers et al., 1993).</p>	
<p>Scientific Quality: <i>Peer reviewed. Sample is of decent size, but is disproportionately male, white, married, and Christian. These demographics may limit the generalizability, given that the sample is specifically “consistent with demographics of Utah” (Renshaw, 2011, p. 322). Method and statistical analysis are clearly explained, but entirely dependent on self-report data. Quality = medium.</i></p>	
<p>Core Findings: Results showed that when not considering combat experience, higher preparedness was correlated with lower levels of PTSD; this suggests that troops with no combat experience are likely to experience fewer symptoms of PTSD if they have maximized their military training and preparation pre-deployment. Contrary to what was predicted, preparedness was positively correlated with perceived threat, (i.e. the more prepared one was, the greater the perceived the threat, when mediated by combat experience). This suggests that troops who have been exposed to highly dangerous situations are familiar with what to expect and thus perceive more threat despite their high level of preparedness.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: This study supports that first responders should maximize their training in order to potentially reduce their risk of PTSD development. The mediation of the combat experience variable indirectly suggests that first responder experience (i.e. not just frequency but also type and severity of experience) needs to be more thoroughly investigated in future research on first responder PTSD.</p>

3.8 Low peer support and emotional expression associated with higher rates of PTSD in student paramedics

Full Reference: LOWERY, K., & STOKES, M.A. 2005. Role of peer support and emotional expression on posttraumatic stress disorder in student paramedics. <i>Journal of Traumatic Stress</i> , 18, 171-179. .	
Purpose of the Study: To contrast and test the predictive value of the social support in helping alleviate traumatic stress symptoms and exploring the role of emotional expression in managing stress.	
Method/Measures: Student paramedics (N = 42) completed a questionnaire that included measures of posttraumatic stress, peer support, and attitudes towards emotional expression. Path analysis was used to analyze the data.	
Scientific Quality: <i>Peer-reviewed. The authors used established statistical methods but had a relatively small sample size. Quality = medium.</i>	
Core Findings: 5% of the sample met the diagnostic criteria for PTSD. Path analysis did not support the reverse-buffering hypothesis or the information-processing model of PTSD. Peer support was negatively related to PTSD and a negative attitude toward emotional expression was positively related to PTSD.	
Type of Sample/ Emergency Responder: Paramedic students	Relevance: Having low levels of peer support and feeling a need to maintain an emotional distance may be PTSD risk factors for paramedics.



4. Treatment of PTSD

4.1 Interventions for PTSD and trauma in emergency ambulance personnel – Poor support for critical incident debriefing

<p>Full Reference: SMITH, A., & ROBERTS, K. 2003. Interventions for post-traumatic stress disorder and psychological distress in emergency ambulance personnel: A review of the literature. <i>Emergency Medical Journal</i>, 20, 75 – 78.</p>	
<p>Purpose of the Study: To conduct a review of literature on interventions for PTSD and psychological distress in emergency ambulance personnel.</p>	
<p>Method/Measures: Smith and Roberts searched online databases for articles meeting criteria for personnel (ambulance workers as part or all of the population), scope (stress and PTSD) and events (mass disasters, day to day contributors to stress, events of specific personal relevance). Only 10 articles were found that met their criteria.</p>	
<p>Scientific Quality: Peer-reviewed. Due to the strict criteria used and poor quality of available literature, only 10 articles could be used. Quality =medium.</p>	
<p>Core Findings: The majority of articles reviewed looked at critical incident stress debriefing (CISD). Smith and Roberts found that most of the articles were methodologically flawed and conclude that there is limited evidence to support the use of debriefing with ambulance workers. Smith and Roberts identify the need for more high quality research looking at ambulance workers and PTSD, as existing research is inadequate.</p>	
<p>Type of Sample/ Emergency Responder: Emergency ambulance workers</p>	<p>Relevance: Little research has been conducted looking at ambulance workers and PTSD, and much of the work that does exist is not of high quality. Overall, however, the available research does not support the use of debriefing as a PTSD intervention.</p>

4.2 EMDR not proven as effective treatment for PTSD

<p>Full Reference: ALBRIGHT, D.L., & THYER, B. 2010. Does EMDR reduce post-traumatic stress disorder symptomatology in combat veterans? Behavioral Interventions, 25, 1-19.</p>	
<p>Purpose of the Study: To conduct a meta-analysis of literature exploring the effectiveness of Eye-Movement Desensitization and Reprocessing (EMDR).</p>	
<p>Method/Measures: Studies included in this meta-analysis had to be either a randomized control trial (RCT) or to have used a quasi-experimental design. Further, the studies had to include participants with an actual diagnosis of PTSD, PTSD outcome measure, published between 1987 and 2008 and in the English language. In all, they were able to identify 6 RCTs that met their quality criteria and 3 quasi-experimental studies.</p>	
<p>Scientific Quality: <i>This article is published in a peer reviewed journal, but uses a small sample size (due to the strict search criteria). Medium to high quality.</i></p>	
<p>Core Findings: Albright & Thyer conclude that literature findings present very limited evidence supporting the effectiveness of EMDR in reducing PTSD in combat veterans. Specifically, they concluded that there are no well-designed RCTs comparing EMDR against real-life exposure therapy, a treatment with a much stronger level of empirical support in the treatment of PTSD, or against credible placebo-controlled therapies. As such more EDMR studies are necessary to fully understand its impact and to reasonably argue that it is a truly effective form of treatment.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: Until more research has been conducted on the effectiveness of EMDR, the authors argue that it is premature to incorporate EMDR into PTSD treatments for first responders/receivers.</p>



4.3 Psychological debriefing (Critical Incident Stress Debriefing) should not be used

Full Reference: AMERICAN RED CROSS.2010. ACFASP Scientific Review: Critical incident stress debriefing. American Red Cross Advisory Council on First Aid, Aquatics, Safety and Preparedness	
Purpose of the Study: To evaluate the scientific evidence in support of (and against) use of Critical Incident Stress Debriefing (CISD).	
Method/Measures: Reviewed articles assessing single session debriefing, critical incident stress debriefing, and critical incident stress management. Key variables assessed were the quality of the study design, intervention provider information, interventions, outcome measures and the outcomes of the study. The total number of articles reviewed was not provided.	
Scientific Quality: <i>This article was not published in a peer reviewed journal nor was information provided as to the number of articles reviewed. Medium quality.</i>	
Core Findings: Psychological debriefing and group debriefing are not effective in reducing PTSD. CISD/CISM interventions did not eliminate or lessen the development of PTSD.	
Relevance to First Responders/Receivers:	
Type of Sample/ Emergency Responder: N/a	Relevance: CISD should not be used for first responders/receivers following a traumatic incident.

4.4 CBT, EDMR and stress management effective treatments for PTSD

<p>Full Reference: BISSON, J. & ANDREW, M. 2007. Psychological treatment of post-traumatic stress disorder (PTSD). Cochrane Database of Systematic Reviews, 3.</p>	
<p>Purpose of the Study: To perform a systematic review of randomized controlled trials of all psychological treatments for PTSD.</p>	
<p>Method/Measures: Bisson and Andrew evaluated randomized control trials (n = 33) that considered one or more defined psychological treatments to reduce traumatic stress symptoms as compared to placebo or control (e.g., usual care or waiting list control).</p>	
<p>Scientific Quality: <i>This was a Cochrane Collaboration article, the researchers used scientifically sound statistical methods and had a moderate sample size. High quality.</i></p>	
<p>Core Findings: Bisson and Andrew found evidence that individual and group trauma-focused cognitive behavioural therapy/exposure therapy (TFCBT), Eye Movement Desensitization and Reprocessing (EMDR), and stress management were effective in treating PTSD symptoms. Specifically, they found that TFCBT, EMDR and stress management were all better than wait list/usual care in reducing symptoms, depression and anxiety. EMDR was found to be as effective as trauma-focused cognitive behaviour therapy (TFCBT) and more effective than stress management.</p>	
<p>Type of Sample/ Emergency Responder: N/a</p>	<p>Relevance: Individual and group TFCBT, EMDR, and stress management are all methods that could be used to treat first responders/receivers with PTSD symptoms.</p>

4.5 Cognitive processing therapy and prolonged exposure can reduce PTSD symptoms

<p>Full Reference: CIGRANG, J.A., RAUNCH, S.A.M., AVILA, L.L., BRYAN, C.J., GOODIE, J.L., HRYSHKO-MULLEN, A., & PETERSON, A.L. 2011. Treatment of active-duty military with PTSD in primary care: Early findings. <i>Psychological Services</i>, 8, 104-113.</p>	
<p>Purpose of the Study: To consider the early findings from a cognitive-behavioural treatment intervention to help active-duty military personnel with PTSD following deployment. Specifically, to evaluate if the intervention could be effectively provided in primary care; to determine if the intervention reduced PTSD symptoms and other behavioural health symptoms; and if service members showed decreases of PTSD symptoms as a result of intervention, did this last.</p>	
<p>Method/Measures: Quasi-experimental research design examining changes pre- and post-intervention. Participants who had been identified by their primary care givers as someone exhibiting PTSD symptoms, were asked to meet with a Behavioural Health Consultants (BHC) and again assessed for PTSD, using the PTSD Checklist-Military Version. Measures also included the PTSD Symptom Scale Interview Version (PSS-I), Patient Health Questionnaire – 9 (PHQ-9), Behavioral Health Measure (BHM), Beck Scale for Suicide Ideation, and Deployment Risk and Resilience Inventory (DRRI) Combat Experience and Aftermath-of-Battle subscales. Participants were educated on PTSD, what leads to it, what maintains it, and ways to overcome it, emphasizing the role of avoidance. Treatment was based on an emotional processing theory and drew on the Prolonged Exposure (PE) model and to a lesser extent drew on Cognitive Processing Theory (CPT). Participants documented the deployment incident that caused the greatest amount of current distress and preoccupation, reflecting thoughts, feelings, and physical reactions, and read these each day for 30 minutes or more. Participants and BHC reviewed the narratives and problem solved.</p>	
<p>Scientific Quality: Peer reviewed. Pre- post-quasi-experiment; pilot test; strong measures; procedure well described; self-selecting and small sample with attrition – medium quality.</p>	
<p>Core Findings: PTSD severity, depressive symptoms, and behavioural health improved with treatment. Half of those participating in treatment did not report PTSD after 1 month. The use of combined PE and CPT to treat PTSD in a primary care setting seems to have some merit.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: Combined PE and CPT appear to have some effect in diminishing PTSD symptoms in individuals who have experienced trauma in deployments (e.g., violent injury or death). First responders will often confront trauma of a similar nature, and thus may benefit from a similar treatment approach. To overcome the stigma surrounding mental health issues in these populations, finding help in the primary care setting in lieu of a mental health clinic may lead to identifying and treating those in need. And this intervention seems to have positive effects in a relatively short timeframe.</p>

4.6 Mindfulness linked with decrease in PTSD symptoms

<p>Full Reference: CHOPKO, B.A. &SCHWARTZ, R.C. 2013. The relation between mindfulness and posttraumatic stress symptoms among police officers. <i>Journal of Loss and Trauma</i>, 18, 1-9.</p>	
<p>Purpose of the Study: To investigate the relation between mindfulness and PTSD symptoms among active police officers. Specifically, is the level of mindfulness related to the severity of PTSD?</p>	
<p>Method/Measures: One hundred and eighty three police officers participated in the study. The Kentucky Inventory of Mindfulness Skills (KIMS), a 39-item self-report assessment, was used to measure aspects of mindfulness (i.e., observing, describing, acting with awareness, and accepting without judgement). Each aspect has its own subscale and is designed to assess individuals prior to mindfulness treatment. It is psychometrically sound. For PTSD symptoms (i.e., intrusion, hyper-arousal, and avoidance), the Impact of Event Scale-Revised (IES-R) was used. It is psychometrically sound. The hyper-arousal subscale has strong predictive validity, whereas the arousal and avoidance subscales have been used to show changes after treatment.</p>	
<p>Scientific Quality: <i>Peer reviewed. Study was well described, sample size was good, measures were good, analysis was good, findings consistent with previous research; but study was correlational so cannot make causal conclusions, self-selected sample = medium quality.</i></p>	
<p>Core Findings: Multiple regression results showed that as mindful accepting without judgment increased intrusion, hyper-arousal, and avoidance symptoms all decreased. With respect to mindful describing, results showed decreases in hyper-arousal symptoms. Mindful observing was positively correlated to all three subscales on the IES-R, whereas describing, acting with awareness and accepting without judgment were negatively correlated. This suggests actively observing in the present moment is associated with trauma symptoms.</p>	
<p>Type of Sample/ Emergency Responder: Police</p>	<p>Relevance: Mindful acceptance without judgment appears to be a successful means to overcome PTSD intrusion, avoidance, and hyper-arousal symptoms. Emotions that follow traumatic experiences, such as shame or guilt, emerge from strong judgments of one's role and responsibilities in the situation and maintained by counterfactual ruminations. This research suggests that mindful non-judgmental orientations may help lessen these strong feelings among first responders. Describing how one feels about a traumatic experience also may diminish hyper-arousal and keep in check unwanted emotions, such as aggression.</p>

4.7 Web-based interventions and virtual reality exposure proposed to treat PTSD

Full Reference: CUKOR, J., SPITALNICK, J., DIFEDE, J., RIZZO, A., & ROTHBAUM, B.O. 2009. Emerging treatments for PTSD. <i>Clinical Psychology Review</i> , 28, 715-726.	
Purpose of the Study: To review emerging psychotherapeutic and pharmacologic interventions for the treatment of PTSD (rather than ones that already have an empirical base).	
Method/Measures: The authors reviewed articles on emerging psychotherapeutic and pharmacological treatments for PTSD. Emerging treatments are defined as those with some theoretical basis that have gained some scientific or popular support.	
Scientific Quality: <i>Peer reviewed. Methods not fully discussed (e.g., number of articles reviewed, criteria for review). Medium quality.</i>	
Core Findings: Few of the emerging treatments have sufficient evidence to accurately assess effectiveness. For psychotherapeutic interventions, Cukor et al. report that technological-based treatments have the strongest preliminary evidence. In particular, internet and teleconferencing based interventions may help those who live in remote areas. Also virtual reality (VR) enhanced exposure therapy has shown some success in reducing PTSD symptoms for 9/11 survivors and Iraq/Afghanistan war veterans. Cukor et al. also note that VR therapies, for war vets, could be promoted as a “high-tech” tool to help with “post-combat reintegration training,” which could potentially reduce stigmatization and also appeal to younger patients who have grown up with gaming technology. For pharmacological interventions, D-cycloserine may reduce treatment time and Prazosin has been shown to be effective in the treatment of PTSD-related nightmares. Cukor et al. note that emerging treatments should be used when first-line treatments (e.g., prolonged exposure therapy, cognitive processing therapy) are not successful or require augmentation.	
Relevance to First Responders/Receivers:	
Type of Sample/ Emergency Responder: N/a	Relevance: Cukor et al.’s review highlights two emerging psychotherapeutic treatments that may be useful for treating first responders with PTSD. First, internet and teleconferencing-based interventions may be useful to enable first responders living in remote areas to access treatment (e.g., police officers living in northern rural communities). Second, virtual reality enhanced exposure environments could be developed specifically for first responders (e.g., simulate a fire incident, simulate a multiple vehicle accident incident) who are unable or unwilling to engage in traditional imaginal exposure treatment of PTSD.

4.8 PTSD treatments are contentious – Cognitive behaviour therapies argued to be most effective

<p>Full Reference: EHLERS, A., BISSON, J., CLARK, D.M., CREAMER, M., PILLING, S., RICHARDS, D., SCHNURR, P.P., TURNER, S., & YULE, W. 2010. Do all psychological treatments really work the same in posttraumatic stress disorder? <i>Clinical Psychology Review</i>, 30, 269-276.</p>	
<p>Purpose of the Study: This report is a critical examination of Benish et al.'s (2008) meta-analysis, which suggests that therapeutic PTSD treatments (e.g., trauma-based therapies such as trauma-based cognitive behavioural therapy (TFCBT) and eye movement desensitization and reprocessing (EMDR)) are equally effective. Ehlers et al. (2010) argue that the analysis by Benish et al. (2008) is biased (i.e. in how it examined non-directive therapies and in its exclusion criteria), and that it fails to compare its examined treatments to natural recovery rates for PTSD.</p>	
<p>Method/Measures: The researchers examined Benish et al.'s (2008) meta-analysis by giving specific examples of inconsistencies and biases and by comparing to other meta-analytic data (e.g., Bisson et al., 2007; Cloitre, 2009). They also compared therapies' obtained effect sizes from previous research to support their argument against Benish et al.</p>	
<p>Scientific Quality: <i>Peer-reviewed Ehlers et al. (2010) do not perform any statistical tests; their arguments are theoretical rather than empirical but are supported by a long reference list. Quality = medium.</i></p>	
<p>Core Findings: Ehlers et al. (2010) strongly criticized the inclusion criteria used by Benish et al. (2008) when selecting studies, arguing that it was biased and excluded many studies that used randomized control trials, essentially removing strong statistical evidence supporting trauma-based therapies from their analysis. Ehlers et al. (2010) also argued that Benish et al. used quotes somewhat out of context from other studies, creating an illusion of supporting arguments for their claim.</p> <p>Ehlers et al. (2010) review some of the more substantial literature that suggests the effectiveness of trauma-focused therapies. In Figure 2, Ehlers et al. show the effect sizes for treatment success across a wide range of studies examining therapies including hypnotherapy, exposure therapies, trauma desensitization, psychodynamic therapy, and cognitive behavioural therapies. Within the figure, it is clear that CBT yields the greatest effect sizes.</p>	
<p>Type of Sample/ Emergency Responder: N/a</p>	<p>Relevance: This article shows the contentious debates around PTSD treatments, and these will be important for the first responder community to understand. However, this report does show that trauma-focused cognitive behavioural therapies are among the best treatments available for sufferers of PTSD.</p>



4.9 Barriers to the acceptance of EBTs come from several sources, but can be overcome

<p>Full Reference: FOA, E. B., GILLIHAN, S. J., & BRYANT, R. A. 2013. Challenges and successes in dissemination of evidence-based treatments for posttraumatic stress: Lessons learned from prolonged exposure therapy for PTSD. <i>Psychological Science in the Public Interest</i>, 14, 65-111.</p>	
<p>Purpose of the Study: The authors aimed to review the current available literature on the treatment of PTSD with a focus on prolonged exposure (PE) therapy. Further, they aim to underscore the importance of evidence-based treatments (EBTs) and discuss the barriers to the adoption of EBTs.</p>	
<p>Method/Measures: The authors conducted a literature review of the efforts in the dissemination of EBTs for PTSD. In doing so, the authors created a list of the challenges faced in disseminating EBTs and reviewed efforts, both within the United States and internationally, at disseminating PE and similar treatments in an effort to illustrate the challenges and successes faced. They further suggest ways of overcoming the barriers and future directions for the effective dissemination of EBTs for PTSD.</p>	
<p>Scientific Quality: <i>Peer reviewed. This review included an extensive review of the literature that satisfied the aims of the research. The papers that were included in the review came from a variety of sources within the field of psychology and cover a wide body of psychological knowledge about the dissemination of EBTs for PTSD. The paper was well researched and comprehensive. High quality.</i></p>	
<p>Core Findings: The authors identified several barriers to effective treatment of PTSD, including a professional culture that is often not accepting of EBTs, a lack of clinical training in EBTs, limited effectiveness of EBT dissemination techniques, and a high cost of effective dissemination models. The authors also suggest a variety of ways to promote the dissemination of EBTs within communities of need. These included web-based treatment, which has been found in some cases to be as effective as face-to-face therapy in managing anxiety and depression conditions, and the utility of telemedicine, which has been shown to reduce PTSD symptoms in veterans. The authors also discuss five major principles drawn from evidence-informed practices that can be utilized in large-scale disasters when it is unreasonable to assume that the large number of people that may require counselling will receive it. These include: promoting (a) a sense of safety, (b) calm or arousal reduction, (c) a sense of efficacy, (d) social connectedness, and (e) hope or expectancy of recovery.</p>	
<p>Type of Sample/ Emergency Responder: N/a</p>	<p>Relevance: The research discussed in this paper points to challenges faced when attempting to implement a plan of EBT for PTSD. Understanding the barriers to dissemination allows the first responder/receiver community to be pro-active in their attempts to combat these barriers to getting an effective treatment to those who are in greatest need. The authors also point to some effective future directions for the dissemination of EBT to a wider, potentially more receptive audience through the use of the World Wide Web and telemedicine.</p>

4.10 Non-military trauma interacts with combat exposure to increase the severity of PTSD

<p>Full Reference: FORBES, D., FLETCHER, S., PHELPS, A., WADE, D., CREAMER, M., & O'DONNELL, M. 2013. Impact of combat and non-military trauma exposure on symptom reduction following treatment for veterans with posttraumatic stress disorder. <i>Psychiatry Research</i>, 206, 33-36.</p>	
<p>Purpose of the Study: Forbes et al. (2013) investigated severity of PTSD symptoms in military personnel exposed to combat trauma as well as non-military trauma (NMT). The study also examined the effectiveness of an Australian PTSD group-based treatment program (c.f. Creamer et al., 2006).</p>	
<p>Method/Measures: The sample was comprised of 1548 male veterans (mean age = 55) with the majority having moderate PTSD. Diagnosis of PTSD was confirmed using Blake et al.'s (1995) Clinician Administered PTSD Scale (CAPS). Combat exposure was measured using the self-report Combat Exposure Scale (CES; Keane et al., 1989). To measure treatment effectiveness, PCL (Posttraumatic Stress Disorder Checklist) scores were taken prior to treatment and at 9 months post-treatment. Some additional scales were used to measure comorbidity of alcohol use disorder, anxiety, depression and non-military trauma.</p>	
<p>Scientific Quality: <i>Peer reviewed. The researchers use a wide range of measures, some of which do not rely solely on self-report and they thoroughly explain their rationale for their method of statistical analysis. A good sample size, however, generalizability is limited given that all participants were male. Quality = high.</i></p>	
<p>Core Findings: The study confirmed that greater combat exposure is tightly linked with greater PTSD severity. With regard to non-military trauma, at intake, significant differences were found between those with high combat exposure and non-military trauma exposure (High CES/NMT) and those with low combat exposure and non-military trauma (Low CES/NMT), suggesting that combat trauma interacts with non-military trauma. Specifically, the High CES/NMT group showed greater levels of PTSD. At the 9-month post-treatment mark, all participants showed the same level of PTSD symptoms regardless of their exposure to combat trauma and non-military trauma. This suggests that personnel with high combat exposure and non-military trauma were more helped by the treatment than those with low combat exposure and no non-military trauma.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: The study highlights the need to understand any trauma history a first responder may have, as this can help predict subsequent development of PTSD symptoms. Previous exposure to non-emergency related trauma will likely influence how well they adjust to repeated exposure to emergency related trauma.</p>

4.11 Debriefing does not reduce PTSD – evidence inconclusive for the effectiveness of other treatments

<p>Full Reference: FORNERIS, C.A., GARTLEHNER, G., BROWNLEY, K.A., GAYNES, B. N., SONIS, J., COKER-SCHWIMMER, E., JONAS, D.E., GREENBLATT, A., WILKINS, T.M., WOODSELL, C.L., & LOHR, K.N. 2013. Interventions to prevent post-traumatic stress disorder: A systematic review. American Journal of Preventative Medicine, 44, 635-650.</p>	
<p>Purpose of the Study: Systematic review of the literature relevant to the efficacy, effectiveness and harms of psychological and pharmacological treatments for adults with PTSD.</p>	
<p>Method/Measures: The authors evaluated studies including randomized controlled trails, nonrandomized controlled trials and prospective cohort studies and case-control studies with adults more than 18, an intervention within 3 months of traumatic exposure and direct measures of either PTSD or the symptoms of PTSD. In the end, 19 studies were judged as meeting the critical criteria and as having no more than low to medium risk of bias. The majority of these studies (16 of 19) were psychological interventions, and 11 of these assessed the efficacy of the intervention for preventing PTSD or reducing its symptoms. Debriefing was judged to be the only intervention allowing confident conclusions. Research showed that it did <u>not</u> reduce the occurrence of PTSD or the severity of its symptoms, either at intervals of 2 weeks or 11 months after. However, this conclusion was based on only two studies. Additional analyses compared 8 studies using both a psychological and pharmacological intervention, but the studies available provided insufficient evidence for conclusions about the effectiveness of this combined approach.</p>	
<p>Scientific Quality: Peer reviewed. The selection of studies to be evaluated was done systematically. The criteria for the evaluation of the strength of the evidence presented by the evaluated studies were well laid out and easily identifiable. The methodology used for evaluation was appropriate to the aims of the paper. High quality.</p>	
<p>Core Findings: Debriefing was judged to be the only intervention allowing confident conclusions. Research showed that it did <u>not</u> reduce the occurrence of PTSD or the severity of its symptoms, either at intervals of 2 weeks or 11 months after. However, this conclusion was based on only two studies. Additional analyses compared 8 studies using both a psychological and pharmacological intervention, but the studies available provided insufficient evidence for conclusions about the effectiveness of this combined approach. Cognitive behavioural therapy was found to be more effective than just supportive counseling in reducing the severity of PTSD symptoms.</p>	
<p>Type of Sample/ Emergency Responder: N/a</p>	<p>Relevance: While the paper did not point to clear evidence for effective preventative measures to buffer against the development of PTSD, it did show that there is evidence that debriefing is not only ineffective at reducing the occurrence of PTSD, it may in fact increase the severity of symptoms. This paper provides some evidence that cognitive behavioural therapy may be of some for preventing the development of PTSD symptoms.</p>

4.12 A case study of trauma-focused treatment for PTSD

<p>Full Reference: HAUGEN, P.T., KEISLER SPLAUN, A., EVCES, M.R., & WEISS, D.S. 2013. Integrative approach for the treatment of posttraumatic stress disorder in 9/11 first responders: Three core techniques. <i>Psychotherapy</i>, 50, 336-340.</p>	
<p>Purpose of the Study: The authors aim was to discuss what they describe as the three core techniques to trauma-focused treatment efficacy: 1) “meaning making”, 2) affect laden focus of traumatic memories, and 3) trauma recall avoidance strategies.</p>	
<p>Method/Measures: The article is a discussion of treatment strategies covering the three core techniques. It focuses on a case example of a first responder who was involved in the aftermath of 9/11.</p>	
<p>Scientific Quality: <i>No actual tests are performed. Reference list is satisfactory but not extensive. Overall discussion could be more detailed. Case study examples are meaningful. Peer reviewed. Quality = low to medium.</i></p>	
<p>Core Findings: Meaning making is about helping the patient describe the trauma and explain why it affects them the way it does. Patients often act as though their reaction to the trauma was normal and that everyone would react the same way, but the focus is making them describe the experience itself.</p> <p>The focus on affect helps patients to come to terms with their emotions in relation to the traumatic event. Following trauma, patients can feel anything from anger, fear, anxiety, embarrassment, and guilt. If they openly acknowledge and describe these feelings, the researchers argue, the emotions become tolerable and even begin to decrease.</p> <p>Trauma recall avoidance can be intentional or automatic, the latter of which is a defensive reaction. Examination of when the avoidance occurs helps both the patient and the clinician understand why the avoidance occurs. This process takes many steps, as the patient likely experiences increased anxiety when discussing the avoidance stimulus.</p>	
<p>Type of Sample/ Emergency Responder: Firefighters Police Emergency management personnel</p>	<p>Relevance: The article gives specific case examples of a first responder’s PTSD symptomology following the attack of 9/11, which helps to show how the treatment can be carried out with other first responders following traumatic events.</p>



4.13 Evidence supports the use of CBT and BEP

<p>Full Reference: HAUGEN, P.T., EVCES, M., & WEISS, D.S. 2012. Treating posttraumatic stress disorder in first responders: A systematic review. <i>Clinical Psychology Review</i>, 32, 370-380.</p>	
<p>Purpose of the Study: To conduct a systematic review of treatment studies for first responders.</p>	
<p>Method/Measures: The authors conducted a review of articles in which a psychological or pharmacologic intervention was delivered to first responders with a primary diagnosis of PTSD, and in which PTSD diagnosis or symptom status was the main study outcome. Despite identifying 845 potential articles, only 17 articles met inclusion requirements.</p>	
<p>Scientific Quality: <i>This article is published in a peer reviewed journal, but uses a small sample size (due to the strict search criteria). Medium to high quality.</i></p>	
<p>Core Findings: Haugen, Evces and Weiss conclude that PTSD treatment research using a first responder population is surprisingly sparse. However, the limited evidence that is available for first responders supports current treatment guidelines recommending Cognitive Behavioural Therapy (CBT) as a first-line treatment for PTSD. Evidence also supports the use of Brief Eclectic Psychotherapy (BEP) as a first-line treatment in police officers.</p>	
<p>Type of Sample/ Emergency Responder: Firefighters Police Emergency management personnel</p>	<p>Relevance: Based on the limited research available, CBT and BEP may be good first line treatment for PTSD symptoms in first responders/receivers.</p>

4.14 Effective short-term treatment for PTSD and depression

<p>Full Reference: LANDE, R.G., BANKS WILLIAMS, L., FRANCIS, J.L., GRAGNANI, C., & MORIN, M.L. 2011. Characteristics and effectiveness of an intensive military outpatient treatment program for PTSD. <i>Journal of Aggression, Maltreatment & Trauma</i>, 20, 530-538.</p>	
<p>Purpose of the Study: The study examines an intense treatment program known as the Psychiatry Continuity Service (PCS) offered at the Walter Reed Army Medical Center in Washington, DC. The program focuses on evidence-based approaches such as exposure therapy, but also integrates medication management and group therapy, among other therapies (e.g., art therapy, light therapy). Clinical outcome measures are used to assess the effectiveness of the treatments.</p>	
<p>Method/Measures: 39 military personnel (85% male) were surveyed. Self-report demographic measures were taken and included questions specifically pertaining to military experience (e.g., military rank, deployment details, and combat experience). PTSD was measured using the self-report Posttraumatic Stress Disorder Checklist (PCL)-Military version. Depression was measured using the Zung Self-Rating Depression Scale (SDS).</p>	
<p>Scientific Quality: Peer reviewed. For a relatively complex treatment program, the researchers used a relatively simple statistical analysis (e.g., paired t-test) to compare data in the realm of military experience, PTSD, and depression. All data rely on self-reports only, with no input from actual clinicians. Quality = medium.</p>	
<p>Core Findings: Lande et al. (2011) found that PCL (posttraumatic stress) scores as well as SDS (depression) scores were significantly decreased at Week 3 compared to scores at the beginning of treatment (baseline). In the discussion section, the researchers explain that although scores are markedly decreased across the three weeks of outpatient treatment, symptom ratings remained in the moderate range. They suggest this means that the program would be even more effective if extended in duration.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: This study shows that repeated exposure can increase one's risk of developing PTSD, and furthermore can translate into more severe symptoms of PTSD. The majority of participants had repeated exposure to extreme combat trauma (e.g., direct fire from an enemy, witnessing death of a soldier, car bombings, etc.). This finding is concerning for emergency responders, given that they are frequently exposed to potentially traumatic events. Some of the combat traumatic events discussed are directly relevant to first responders, such as body recovery.</p>



4.15 Integrated treatment programs required if comorbid diagnoses exist

<p>Full Reference: OTIS, J.D., KEANE, T.M., KERNS, R.D., MONSON, C., & SCIOLI, E. 2009. The development of an integrated treatment for veterans with comorbid chronic pain and posttraumatic stress disorder. <i>Pain Medicine</i>, 10, 1300 - 1311.</p>	
<p>Purpose of the Study: To describe the development of an integrated treatment for Veterans with comorbid chronic pain and PTSD, including the benefits and challenges of treatment.</p>	
<p>Method/Measures: The authors developed an integrated treatment program that combined cognitive behavioural therapy for chronic pain and cognitive processing therapy for PTSD. The integrated treatment was piloted with veterans with PTSD and chronic pain ($n = 3$). PTSD was measured using the Clinician-Administered PTSD Scale and the PTSD Checklist – Specific Version, and pain was measured using the McGill Pain Questionnaire. Depression and disability were also measured.</p>	
<p>Scientific Quality: <i>Peer-reviewed. However, the pilot study had a very small sample size and there was no comparison group. Medium quality.</i></p>	
<p>Core Findings: Only three of the patients completed the treatment program. Two patients no longer met diagnostic criteria for PTSD and experienced reductions in chronic pain symptoms at the end of treatment. The third patient still met diagnostic criteria for PTSD and had similar levels of chronic pain. Challenges to treatment included establishing trust (most patients had difficulty trusting others), treatment attendance (sessions often missed unless a reminder phone call was made), avoidance (patients were less likely to attend a subsequent session if homework assignment required them to think about their trauma), and homework completion (often homework was not done).</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: The authors note that there are high rates of comorbidity for pain and PTSD and that treatments addressing only one symptom (either sequentially or concurrently) can make each disorder worse. These findings suggest that an integrated treatment program would be more effective in helping first responders/receivers find relief from PTSD and chronic pain.</p>

4.16 Psychotherapeutic and pharmacological interventions found to be useful for the treatment of PTSD

<p>Full Reference: PRATCHETT, L.C., DALY, K., BIERER, L.M., & YEHUDA, R. 2011. New approaches to combining pharmacotherapy and psychotherapy for posttraumatic stress disorder. <i>Expert Opinion on Pharmacotherapy</i>, 12, 2339-2354.</p>	
<p>Purpose of the Study: To review literature on early interventions, psychotherapeutic interventions, and pharmacologic interventions for treating PTSD.</p>	
<p>Method/Measures: Literature review. No details were provided as to number of articles reviewed or inclusion requirements.</p>	
<p>Scientific Quality: <i>Peer reviewed. No information was provided as to the number of articles reviewed or the inclusion requirements. Low quality.</i></p>	
<p>Core Findings: Prevention and early interventions: No clinical support has been found for psychological debriefing and it might even have an adverse effect. Trauma-focused CBT also shows promise for those individuals with a diagnosis of ASD or symptoms of PTSD within the first 3 months following trauma. Psychotherapeutic interventions: Support has been found for exposure therapy (especially prolonged exposure), stress inoculation training, cognitive processing therapy, as well as eye movement desensitization and reprocessing. Emerging treatments that have initial positive results for PTSD symptoms include brief eclectic psychotherapy, narrative exposure, imagery rehearsal therapy, ERRT (exposure, relaxation, and re-scripting therapy), behavioral activation, and virtual reality exposure. Pharmacological intervention: There is some evidence that up to 30% of PTSD patients prescribed Selective Serotonin Reuptake Inhibitors (SSRIs) may achieve full remission after 3 months of treatment</p>	
<p>Type of Sample/ Emergency Responder: N/a</p>	<p>Relevance: The authors provide a list of interventions that might be appropriate interventions for first responders/receivers. They identify interventions that are already established as being effective and have highlighted emerging treatments that are promising, but need more research before the interventions can be promoted for use.</p>



4.17 Psychotherapy, psycho-education, and medication management effective treatments especially when initial PTSD symptoms are severe

<p>Full Reference: RICHARDSON, J.D., ELHAI, J.D., & SARREEN, J. 2011. Predictors of treatment response in Canadian combat and peacekeeping veterans with military-related Posttraumatic Stress Disorder. <i>Journal of Nervous and Mental Disease</i>, 199, 639-645.</p>	
<p>Purpose of the Study: This study examined the predictors for treatment success in 102 (97% male) military veterans with PTSD. Comorbidity of related disorders such as anxiety, depression, and alcohol abuse was also examined. Treatment included psychotherapy with trained clinicians, psycho-education about PTSD, and medication management.</p>	
<p>Method/Measures: PTSD was confirmed using the CAPS (Blake et al., 1995) and treatment success was measured by repeated administration of the PCL-M (Weathers et al., 1993). Comorbid disorders were measured using the following: Depression and anxiety by the BDI-II and BAI-II (Beck, 1967; Beck et al., 1988a); alcohol abuse by the AUDIT (Allen et al., 1997); quality of life by the SF-36 (Ware et al., 1993). The researchers highlight the importance of latent growth modeling over repeated measures analysis.</p>	
<p>Scientific Quality: Peer reviewed. Use of reliable and validated measures. Sample size is decent but could be larger. Strong explanation of statistical analysis and findings, and extensive use of supporting relevant references. High quality.</p>	
<p>Core Findings: PTSD scores significantly decreased over the 12 months observed following treatment; veterans with higher baseline scores of PTSD showed the greatest improvement. Symptoms of comorbid disorders decreased as well, but were not significant covariates to the decrease in PTSD symptoms. High initial anxiety levels were predictive of depression decline following treatment.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: The treatment examined in this study proved effective for combat/trauma-exposed veterans. Treatment targeted at first responders should consider similar intervention method combinations. A replication study investigating first responders specifically is a direction for future research.</p>

4.18 Socio-cultural environment, social network, and system-level factors key to the initiation of treatment for PTSD

<p>Full Reference: SAYER, N. A., FRIEDEMANN-SANCHEZ, G., SPOONT, M., MURDOCH, M., PARKER, L. E., CHIROS, C., & ROSENHEK, R. 2009. A qualitative study of determinants of PTSD treatment initiation in veterans. <i>Psychiatry</i>, 72, 238-255.</p>	
<p>Purpose of the Study: The authors aimed to identify factors that hinder and those facilitate the initiation of treatment for PTSD using in-depth interviews rather than self-report measures.</p>	
<p>Method/Measures: Using a semi-structured interview, the authors interviewed 44 U.S. military veterans from the Vietnam and Afghanistan/Iraq wars who had submitted disability claims to the U.S. Department of Veteran Affairs (VA) on the basis of military related-PTSD. Half of the participants were currently undergoing treatment for PTSD, while the other half was not. Each participant was interviewed with regards to their mental health treatment history, the facilitators of professional help-seeking (for those who were in treatment), barriers to seeking professional help, satisfaction with current treatment (for those who were in treatment), potential facilitators, any help they received for PTSD from non-professionals such as friends, spiritual or religious counselors, etc., and their view of PTSD and PTSD disability benefits. Participants also completed a series of self-report questionnaires (background survey, PTSD Checklist, Patient Health Questionnaire – Depression Module, Alcohol Use Disorders Identification Test – Consumption Questions). The interviews were transcribed and coded by the research team with each interview being coded by at least two research team members. Discrepancies between coders were discussed face-to-face in order to reach consensus.</p>	
<p>Scientific Quality: <i>Peer reviewed. The research objectives were clearly stated and the interview protocol was clearly developed with the research objective in mind. The themes of the interview were well described as was the selection and exclusion criteria for participants. The data analysis was systematic and well described and the mix of semi-structured interview and self-report questionnaires provided richness to the data. The conclusions drawn by the authors were supported by the results described in the paper. High quality.</i></p>	
<p>Core Findings: The authors identified seven barriers to and four facilitators of treatment initiation. Within these barriers and facilitators, the authors identified a key finding. Specifically, they found that the socio-cultural environment (e.g., societal rejection, negative homecoming experiences), one's social network (e.g., spouses and partners, other family members, employers, etc.), and system-level factors (e.g., ease of enrollment in and access to treatment, etc.) played a vitally important role in determining whether or not an individual is likely to initiate treatment for PTSD. These areas provide gateways for encouraging the initiation of treatment for PTSD.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: Establishing an accepting socio-cultural environment (e.g., social acceptance, social encouragement of help-seeking) is the primary key to initiating treatment for PTSD. Beyond that, organizations should work to remove barriers to access such as a complicated treatment enrollment process or expense of treatment by developing system-level factors that facilitate treatment initiation (e.g., a streamlined enrollment process that is easy to understand, health-care benefits that cover the cost of treatment). Finally, a social network (e.g., family, friends, employers, etc.) that encourages treatment is the single best indicator that an individual will initiate treatment for PTSD.</p>



4.19 No treatment is right for everyone after a trauma, but CBT is effective for those showing trauma stress symptoms

<p>Full Reference: ROBERTS, N.P., KITCHINER, N.J., KENARDY, J., & BISSON, J.I. 2009. Systematic review and meta-analysis of multiple-session early interventions following traumatic events. <i>American Journal of Psychiatry</i>, 166, 293-301.</p>	
<p>Purpose of the Study: To determine the efficacy of multiple-session psychological interventions to prevent and treat traumatic stress symptoms beginning within 3 months of a traumatic event.</p>	
<p>Method/Measures: The reviewers performed a systematic review and meta-analysis of randomized controlled trials (n = 25) that considered one or more defined psychological interventions or treatments (excluding single-session interventions) aimed at preventing or reducing traumatic stress symptoms in comparison with a placebo control, other control (e.g., usual care or waiting list control), or alternative psychological treatment condition.</p>	
<p>Scientific Quality: <i>Peer-reviewed, provided details of analyses. High quality.</i></p>	
<p>Core Findings: The authors concluded that no psychological intervention can be recommended for routine use following traumatic events. Their analyses showed no evidence for the effectiveness of a multiple-session intervention aimed at everyone (whether showing trauma-related symptoms or not) was effective. However, when individuals are showing trauma stress symptoms, trauma-focused cognitive behavioral therapy (CBT) was found to be significantly better than waiting list and supportive counseling. Effects were greatest for treatment of acute stress disorder (ASD) and PTSD. Cognitive restructuring was also found to be statistically better than waiting list, but less effective than trauma-focused CBT.</p>	
<p>Type of Sample/ Emergency Responder: N/a</p>	<p>Relevance: The results of this study indicate that the most appropriate intervention for use with first responders/receivers within 3 months of a traumatic event is trauma-focused CBT, but only if they are already showing symptoms of ASD or acute PTSD.</p>

4.20 National Academies Press - Comprehensive guidelines on the prevention, diagnosis, and treatment of PTSD

<p>Full Reference: INSTITUTE OF MEDICINE. 2012. Treatment for posttraumatic stress disorder in military and veteran populations: Initial assessment. Washington, DC: The National Academies Press.</p>	
<p>Purpose of the Study: The aim of this report was to summarize the literature with regard to PTSD in military service members and veterans with an exploration of its prevention, diagnosis, and treatment. A secondary aim of this report was to evaluate cost considerations, new neurobiological findings, and the use of complementary and alternative treatments.</p>	
<p>Method/Measures: The authors conducted an extensive literature search including government documents and data; two public information-gathering sessions, meetings with a variety of mental health providers and with PTSD patients and their families, and information from the Veterans Health Administration.</p>	
<p>Scientific Quality: <i>Reviewed by a diverse group of professionals chosen based on their different perspectives and expertise. A wide body of research was included in this comprehensive review of the state of PTSD, its prevention and interventions. Each aspect of the report appeared to be thorough and well-researched. Priority was given in their review to RBTs and EBTs though a discussion of treatments that have not been thoroughly researched was also included and created a more extensive review of the literature. High quality.</i></p>	
<p>Core Findings: The report indicates that, within the US military, there have been two primary approaches to the prevention of PTSD: prepare service members for combat and other deployment-related stressors and intervene quickly after exposure. However, there has been little empirical evidence regarding the effectiveness of the pre-deployment approaches utilized. On the other hand, there has been research indicating that interventions at the early stages of acute stress disorder have been effective in reducing symptoms and preventing the onset of PTSD. The report lists a number of screen tools that have been used by the VA and the DOD, however, the authors emphasize that screening for PTSD is ineffective unless there is adequate follow-up and capability to provide appropriate treatment. The most widely researched psychosocial treatments for PTSD are CBTs including prolonged exposure therapy, stress inoculation training or anxiety-management programs, and cognitive processing therapy. The most common pharmacological treatment for PTSD is the use of antidepressants, specifically, selective serotonin reuptake inhibitors (SSRIs) or serotonin norepinephrine reuptake inhibitors (SNRIs), however, there is no conclusive research with regard to the efficacy of these treatments for PTSD. Any treatment for PTSD must consider potentially co-occurring conditions.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: The report provides five action items that can be applied equally to first responders/receivers:</p> <ul style="list-style-type: none"> • Analyze: Assessment data should be collected before, during and after treatment to assess the effectiveness of the treatment and research should be ongoing with regards to their efficacy. • Implement: PTSD screening should be conducted at least once a year • Innovate: Alternative treatments should be considered especially when comorbid conditions exist. Neurobiology may be a future alternative for the screening, diagnosis and treatment of PTSD. • Overcome: Barriers that exist include awareness, accessibility availability, acceptability and adherence to EBTs. These may be overcome with the use of emerging technologies such as mobile, telemedicine, Internet-based treatment, and virtual reality. • Integrate: Treatment for comorbidities should be integrated with the treatment of PTSD.



5. Multiple Topics Related to PTSD

5.1 A guide to the best interventions and timing of care for PTSD patients

<p>Full Reference: DEPARTMENT OF VETERANS AFFAIRS/DEPARTMENT OF DEFENSE.2010. VA/DoD clinical practice guideline for management of post-traumatic stress. Retrieved from http://www.healthquality.va.gov/ptsd/cpg_PTSD-FULL-201011612.pdf</p>	
<p>Purpose of the Study: This report presents best practice guidelines for treating PTSD in a military population. The report integrates results from randomized controlled trials of pharmacological and psychotherapeutic interventions with evidence-based recommendations for treating post-traumatic stress, which recommendations were evaluated by practicing clinicians and reviewed by clinical experts from Veterans Affairs and the Department of Defense.</p>	
<p>Method/Measures: These best practices were derived on the basis of extensive literature reviews, and build on previous evidence-based guidelines and reports from the Institute of Medicine (2008) and the American Psychological Association (2009) practice guidelines for traumatic stress.</p>	
<p>Scientific Quality: <i>Product of a working group rather than peer-reviewed but seems to be of very high quality. Guidelines were developed using rigorous methodological approaches to conducting a literature review, assessing the strength of the evidence, and formulating recommendations. Input from experienced experts. However, it is impossible to judge possible impact of political biases.</i></p>	
<p>Core Findings: A clinical algorithm is included that acts as a guide to determine the best interventions and timing of care for PTSD patients. At more than 253 pages, this guide represents the most complete and pragmatic approach to managing PTSD available within the literature. The ability to generalize the recommended practices from this guide to the first responder/receiver community should be a core focus of future research efforts.</p>	
<p>Type of Sample/ Emergency Responder: Military</p>	<p>Relevance: This report appears to be the most relevant and best articulated statement of optimal treatment for traumatic stress and PTSD. The results of this research should be validated for use in the emergency responder community.</p>

5.2 PTSD treatment complicated by existing mental health issues

Full Reference: JETLY, R. 2011. Psychiatric lessons learned in Kandahar. Canadian Journal of Surgery (Suppl), 54, S142-S144.	
Purpose of the Study: To share mental health lessons learned from a Multinational Medical Unit deployed to Kandahar working with Canadian Forces soldiers in the field.	
Method/Measures: Reported lessons learned.	
Scientific Quality: Peer reviewed. Written by a Canadian Forces psychiatrist.	
Core Findings: The author argues that soldiers' mental health issues are more than just PTSD. Soldiers are also susceptible to other mental disorders independent of PTSD. Those presenting for treatment in the field often had previous mental illness (e.g., mood, anxiety, depression, substance abuse, obsessive-compulsive disorders), trauma specific conditions, or psychosocial issues (e.g., family problems). They also found that soldiers do well following the traumatic incident, often by reliance on social support (e.g., buddies, leadership) or rapid interventions (e.g., rest). Challenges emerge when treating trauma-related disorders in theatre as some of the civilian best practices cannot be accommodated. For example, ensuring a safe environment (e.g., the trauma lies in the past) or prescribing medication to alleviate symptoms may not be feasible (e.g., may impair soldier functionality). Practitioners also need to adapt to the environment of their clients in order to administer treatment.	
Type of Sample/ Emergency Responder: Military	Relevance: Diagnosis of first responders' mental fitness as a consequence of experiencing trauma should consider not only PTSD, but other mental health disorders. As well, suffering that follows trauma can be mitigated by reliance on comrades and organizational leaders. Organizations should, therefore, develop supportive environments to help personnel cope with PTSD.



5.3 PTSD rates – 30-40% direct victims, 10-20% rescue workers and 5-10% in general population

<p>Full Reference: NERIA, Y., NANDI, A., &GALEA, S. 2008. Post-traumatic stress disorder following disasters: A systematic review. <i>Psychological Medicine</i>, 38, 467-480.</p>	
<p>Purpose of the Study: Neria, Nandi, and Galea (2008) explored factors associated with the onset of PTSD following exposure to disasters.</p>	
<p>Method/Measures: They reviewed 284 reports from 1980 (when PTSD was first introduced to the DSM III as a psychiatric condition) – 2007 that related specifically to PTSD (using strict symptom criteria to rule out other influences).</p>	
<p>Scientific Quality: <i>Peer reviewed, systematic search through 284 studies = high quality</i></p>	
<p>Core Findings: PTSD was more common in disasters with high levels of physical injury, risk to life, high severity of property damage, and a high number of casualties. Prevalence of PTSD was estimated to be between 30% and 40% for direct victims, between 10% to 20% for rescue workers, and between 5% and 10% in the general population.</p> <p>For human-made disasters (such as 9/11 terrorist attacks), the highest prevalence of PTSD was in survivors and first responders who had direct exposure to the disaster and its after effects. For personnel involved in rescue efforts, onset/persistence of PTSD symptoms seemed to range from 1-2 years after a human-made disaster (police responders to the Hillsborough football stadium disaster) to 2 weeks and 10-15 months after the 9/11 terrorist attacks. For technological disasters (such as Chernobyl nuclear reactor accident), the prevalence of PTSD ranged from within the first year to 10 years after exposure (1988 Piper Alpha oil rig disaster – Hull, Alexander, & Klein, 2002). The prevalence of PTSD was typically lower in the case of natural disasters than after human-made or technological disasters. However, the people most directly exposed to natural disasters (e.g., closer to the epicenter of an earthquake) showed a higher prevalence to PTSD.</p>	
<p>Type of Sample/ Emergency Responder: Disaster recovery workers</p>	<p>Relevance: This paper provides strong evidence that people exposed to disaster (both ‘victims’ and first responders) are susceptible to PTSD. Neria et al. found that overall about 10-20% of first responders showed symptoms of PTSD following a disaster, and this usually arises in the first year of exposure. However, PTSD was still an issue a couple of years after the disaster. This review also showed that there is no one accepted definition of disaster nor is there a consistent means of measuring PTSD following a disaster.</p>

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<p>13. ABSTRACT</p> <p style="text-align: center;">This report aims to inform the emergency responder community about Post Traumatic Stress Disorder (PTSD). Given that the available literature within the emergency responder community is very limited, this review relies on the military and scientific literature to explore the issue of traumatic</p>		

stress and PTSD. This review focused on the following four questions:

- How should PTSD be defined, recognized and how often does it occur?
- How can traumatic stress and PTSD be prevented?
- How should traumatic stress and PTSD be treated?
- What research could support management of PTSD in the emergency responder community?

PTSD is a fully developed form of traumatic stress that is only diagnosed after experiencing symptoms for at least a month. PTSD occurs when symptoms evolve in the aftermath of an extreme traumatic stressor that overwhelms an individual's coping capacities. PTSD is a serious and potentially debilitating illness. As such, it needs to be managed effectively using established and validated treatments and tools. Deliberate efforts to manage traumatic stress are critical, particularly for organizations that require their personnel to be exposed to high-risk, traumatic situations. This review concludes with a discussion of research priorities for the emergency responder community to manage PTSD in a more systematic way.

Le présent rapport vise à fournir à la communauté des intervenants d'urgence des renseignements au sujet du trouble de stress post-traumatique (TSPT). Étant donné que les intervenants d'urgence disposent de très peu de documentation sur le traumatisme dû au stress et le TSPT, le rapport s'appuie sur la documentation militaire et scientifique. L'examen a porté sur les quatre questions suivantes :

- De quelle façon le TSPT devrait-il être défini et reconnu, et quelle est sa prévalence?
- Comment peut-on prévenir le traumatisme dû au stress et le TSPT?
- Comment devrait-on traiter le traumatisme dû au stress et le TSPT?
- Quelles recherches pourraient appuyer la prise en charge du TSPT par la communauté des intervenants d'urgence?

Le TSPT est une forme de traumatisme dû au stress ayant atteint un stade avancé, et il peut seulement être diagnostiquée chez des personnes qui présentent des symptômes depuis au moins un mois. Le TSPT se manifeste lorsque les symptômes évoluent à la suite d'un événement exceptionnellement traumatisant qui inhibe les capacités d'adaptation d'une personne. Le TSPT est une maladie grave et potentiellement invalidante. Ainsi, il doit être pris en charge efficacement à l'aide de traitements et d'outils établis et validés. Il est crucial que des efforts délibérés soient déployés pour prendre en charge le traumatisme dû au stress, en particulier au sein des organisations dont le personnel doit être exposé à des situations à risque élevé et traumatisantes. Le rapport se conclut avec une analyse des priorités en ce qui concerne les travaux de recherche à mener pour assurer une prise en charge plus systématique du TSPT par les intervenants d'urgence.

14. KEYWORDS, DESCRIPTORS or IDENTIFIERS

Post-Traumatic Stress Disorder; PTSD; Emergency Responders; Literature Review

