Occupational Medicine 2007;**57:**404–410
doi:10.1093/occmed/kqm070

IN-DEPTH REVIEW

Post-traumatic stress disorder in occupational settings: anticipating and managing the risk

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Background Post-traumatic stress disorder has had a substantial impact on employer liability for workplace psychological injury. The emergency services are an example of high-risk workforces that demand clear policies and procedures within an organization. The challenge is to minimize the injury to individuals and lessen the cost to organizations through the optimal application of preventative strategies.

Methods This field is not well represented in standard keyword searches and Medline was examined with linked fields of practice and research. Consensus guidelines that refer to this domain were also utilized. Few conclusions can be reached from the literature which directly examined occupational settings.

Results Organizations need to anticipate the possible traumatic exposures that may affect the workforce and have strategies to deal with the effects in the workplace, particularly the negative mental health outcomes in some personnel. This domain is relevant to all employers as accidents and violence are possible in most workplaces. Screening should be considered for high-risk individuals, particularly following a major traumatic event or cumulative exposure, such as in the emergency services. While psychological debriefing has no demonstrated benefit, the benefits of early intervention necessitate ready access to evidence-based treatments that have minimum barriers to care. Employers should be aware that distress may present indirectly in a similar way as conflict with management, poor performance and poor general health.

Conclusion The knowledge about the impact of traumatic events obliges employers to have an active strategy to anticipate and manage the aftermath of such events as well as cumulative traumatic exposures.

Key words Emergency services; introduction; occupation; prevention; PTSD; risk management; screening.

Introduction

Post-traumatic stress disorder (PTSD) and its predecessor, traumatic neurosis, have evoked a great deal of interest and controversy in the workplace because of the related issues of compensation and employer negligence. The inclusion of PTSD in DSM-III has transformed the interest in the management of workplace psychiatric disability. The impact has been most apparent in the recognition of workplace injuries for emergency service and military personnel. However, it has equally reformulated the appraisal of the impact of single accidents occurring in the workplace. The definition of PTSD has spurred an emerging body of research which has provided a rich knowledge base for informed prevention [1], early identification and treatment of psychological workplace injury.

Both employees and employers have a great deal to gain from effective prevention [2] and early intervention to prevent secondary disabilities and premature retirement. While every workplace is at risk of unpredictable catastrophic disasters and accidents, there are several occupations that have a predictable and foreseeable risk of being exposed to threat, horrific injury and death. The emergency services, military, acute medical services, bank officers and train drivers have had notable attention in the literature. However, the most accident-prone industries such as mining, agriculture and fishing should not be forgotten although they have gained little systematic attention. The existence of a foreseeable risk is the bedrock upon which the law of negligence is built and hence occupational health personnel cannot avoid being drawn on to give advice and assistance in this domain. It

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needs to be recognized that there is a balance between the duty of care to the individual and the need to ensure that any impairment suffered does not compromise the operational capacity of the organization.

Methods

This paper will review the consequences of exposure to traumatic stress in different workplaces and the application of knowledge to the development of strategies for prevention, which involves managing repeated exposure, and ensuring early identification and screening. The literature search could not solely depend on keywords, as much of the relevant literature is not directly linked to this topic. The keywords 'PTSD' and 'emergency service workers' identified 17 references, missing many seminal papers. 'Screening' and 'PTSD' resulted in 4583 references with excessive truncation when terms such as 'work place' were added. As a consequence, a systematic review using the terms PTSD and occupational stress led to 484 references being identified and was chosen above alternative searches such as PTSD in occupational settings which led to the identification of 10 references. PsychINFO using the keywords of occupational stress and PTSD identified only 67 articles. The literature about the military was not systematically reviewed because of the uniqueness of this occupational environment. Instead, linked conceptual literature was explored. The consensus guidelines by National Institute for Clinical Excellence [3] and National Health Medical Research Council (NHMRC) [4], which addressed screening were specifically examined as were the recommendations of the US Preventative Services Task Force [5]. The summary of this review highlighted that there is scant literature on assessing or managing PTSD reactions in the context of occupational work trauma. In contrast, there is an enormous literature pertaining to these issues from civilian trauma. Accordingly, we summarize the major lessons learnt from civilian trauma and extrapolate to how this evidence should inform practices that aim to manage occupationally related PTSD.

Modelling risk

The risk of developing a psychiatric disorder following exposure to traumatic events is similar to any toxic exposure where a gradient of risk exists. Secondly, the cumulative impact of repeated exposures needs to be anticipated (see Table 1). Significant challenges exist in scaling exposure because of the conceptual challenge of the quantitative relationship between the different components of these events. For example, a single traumatic event may involve witnessing horrific sights of death and mutilation, injury to oneself or others, threat of death or injury, mass destruction, the duration of exposure and the death or injury of colleagues which should all be reflected in any attempt at quantification. However, an awareness of these issues does allow a general profile from an individual event to be calculated [6]. Although many high-risk occupational groups will be exposed to trauma, it is reasonable for employers to attempt to identify those who are at a higher risk for developing post-traumatic disorders.

Table 1. Examples of work place stresses

Occupational—(these can be caused by psychiatric disorders rather than being causal)
Supervisor relations
Group morale and cohesion
Administrative procedures
Workload
Shift duties
Resources
Interpersonal conflict
Traumatic events
Mass disasters
Serious accidents
Threat of death and injury
Death of colleagues
Witnessing death, suffering and injury
Assault

Pre-trauma factors

There is increasing evidence concerning the risk factors for PTSD that antedate the exposure, such as prior traumatic exposures, previous psychiatric or physical injury [7]. There is also an emerging literature that has assessed pre-trauma factors and related these to subsequent post-traumatic stress. For example, there is evidence that firefighters who engage in catastrophic thinking about life events before they enter the fire brigade are more likely to develop post-traumatic stress after commencing active duty [8]. Although the evidence on these pre-disposing factors is scant at this time, it will be important for employers to monitor this growing literature because it will provide an evidence base from which employers can identify those who are most at risk of adverse effects of trauma exposure.

Trauma exposure factors

There is much literature demonstrating that the work of police [9], ambulance officers [10–12] and fire officers [9,13] are intrinsically likely to confront them with traumatic events where they have to witness and manage death and suffering from crime and accidents. The officers themselves can also be put at considerable direct risk of injury or death. The nature of the exposures experienced in emergency service personnel is notably different in that these personnel are specifically trained in a variety of intervention strategies and skills to deal with threat and danger, which is part of their operational role. A variety of systems are put in place to minimize the risk of these

operational exposures. The more typical scenario is where the individual breaks down after repeated experience of a variety of traumatic incidents [12], which entail varying degrees of a sense of personal threat often combined with the witnessing harm or death to others rather than after a single incident [9].

A specific incident that results in the officer making some personal identification with the event [14] or the victim plays an important role determining the vulnerability of the individual to subsequent traumatic exposures. Repeated intense exposures over a period of time leads to an accumulated risk requiring that the assessment of emergency service personnel should focus on the lifetime exposure as well as the immediate antecedent event that may have prompted the presentation for treatment [15]. From a clinical perspective, military and emergency service personnel due to their multiple traumatic exposures may present differently from other victims where a single traumatic event is the primary focus of their traumatic ruminations.

Major terrorist incidents [16], disasters with multiple loss of life, epidemics [17] and exposure to particularly gruesome or horrific accident scenes also carry a significantly greater risk for emergency personnel. Increasingly, as the armed services are involved in humanitarian and peacekeeping duties [18], they can be exposed to situations of considerable human suffering without any immediate threat to themselves. In this regard, in the last decade the exposures of military personnel have an increasing commonality with that of the emergency service workers.

The core concept in the accumulated risk of repeated exposure is sensitization, which refers to a process where there is a progressive increase in the reactivity of the individual to trauma-related cues [19,20]. There is a critical period in the aftermath of traumatic exposure during which irreversible neuronal changes may occur in those who develop PTSD [19]. The epidemiological literature highlights this accumulating risk that represents a major challenge in occupational settings, with the aim in an occupational setting being to minimize this process.

Post-trauma factors

In the aftermath of the event, a range of factors can modify the recovery or escalate distress such as social support and stress that emerge in the aftermath of the event such as continued exposure to the distress of the victims or critical legal investigations of the circumstances of the event where blame is involved [21].

Risk management

One of the challenges for identifying risk is the limited research on the sensitivity and specificity of using any potential marker for identifying an individual as being high risk for post-traumatic disorders. Research typically reports statistical relationships between variables, which are useful for increasing our knowledge about risk factors. These relationships do not provide cut-offs that would guide an employer to reliably identify an employee as being at high risk. An example of this problem is the recent tendency for researchers to use resting heart rate levels as simple markers to identify people immediately after trauma exposure who will subsequently develop PTSD. Although there are numerous studies attesting to the statistical relationship between elevated resting heart rate after trauma and PTSD, all attempts to use cut-offs to mark those who are high risk have failed [22]. The most appropriate means for employers to use the current evidence is to focus on those individuals who have displayed the high risk factors (e.g. prior psychiatric history, repeated exposure to fatalities or very grotesque events, observed deficiency in performance or increase in interpersonal difficulties) and ensure that these individuals are monitored and offered the opportunity for mental heath assistance. This approach would utilize current knowledge in a way that focuses resources on those who are most likely in need of them but also does not make the mistake of presuming that these risk factors necessarily point to disorder.

Given that there are foreseeable risks to various occupational groups, the central challenge is to identify strategies that may minimize the adverse outcomes. One strategy is to deal with the predictable exposures in a workforce such as high-risk emergency services. A systematic assessment should be conducted of the progressive burden of exposure that individuals endure. A strategy developed based on the principles of the known risks of prolonged military combat exposure [23] to have a rotation of duties so that there is an opportunity for the restoration of the normal patterns of psychophysiological arousal. To enact these principles, an organization requires a range of roles that allow rotation on a flexible basis for a given individual. This strategy represents a financial challenge as there is a cost to an organization having a staffing plan that offers such opportunities for rotation of roles. This cost has to be counter balanced against the expense to an organization of losing highly trained personnel through compensable injury.

The further strategy involves the organization having a system in place that anticipates the adverse outcome of the exposures on some individuals (see Table 2). These adverse outcomes can manifest in a variety of ways, including delayed traumatic reactions [24] and non-specific physical symptoms [25]. Supervisors should be trained to detect these indirect manifestations and behaviours as being possible signs of the effects of exposure to traumatic events and institute the appropriate requests for independent health assessments rather than depending on punitive administrative procedures alone. The general sense of camaraderie and collegial support in these organizations often assists the individual in maintaining a facade

Table 2. Responsibilities of occupational health services

Management related
Advice about monitoring trauma exposures
Assist in identification of individuals at risk
Advice about work place rotations in highly exposed individuals
Train supervisors in the manifestations of traumatic stress
Train individuals in strategies for resiliency and health behaviour
Liaise with senior managements regularly
Design policy and procedures, and monitor implementation
Maintain relevant organizational knowledge base
Health service delivery
Multi-disciplinary team with skills to provide evidence treatment
Quality assurance processes
Continuing professional development of personnel
Establish and monitor screening of high-risk employees
Train individuals in strategies for resiliency and health behaviour
Monitor re-exposure of injured workers returned to work
Accessible treatment services
Psychological assessment of non-specific physical symptoms

of functioning and can lead to the tolerance of changed individual performance. It is critical that operational managers have a high index of suspicion so as not to delay assessment and intervention [26].

A major challenge in occupational settings is to address the accumulating risk, with repeated exposures and the secondary issue of identifying workers who have seemingly coped well with a major trauma but have a pattern of delayed emergence of symptoms, sometimes triggered by the exposure to secondary stressors. The core concept explaining the accumulated risk of repeated exposure is sensitization, which refers to a process where there is a progressive increase in the reactivity of the individual to trauma-related cues [19,20,24,27].

Screening

Screening for psychological disorders is an effective strategy in workers who are at significant risk because of their levels of trauma exposure [28]. Such a strategy involves identifying individuals at risk and screening them in the immediate aftermath and again approximately 6 months later. Screening prior to exposure generally has little to offer [29]. Screening questionnaires have false negative and positive rates and those individuals who are identified as being at risk and a small proportion of those who score just below the cut-offs should be interviewed. The setting of these interviews provides an opportunity for the provision of general support and the identification of other organizational and management issues that cause concern and put the individual at risk [30]. Wessely [31] and others [32] have raised the possibility that an unwanted impact of screening is to inadvertently encourage individuals to complain of symptoms despite evidence that giving information, if anything, improves outcomes [33]. Also screening is only effective if it leads to the implementation of treatment when the health services are appropriately resourced and have appropriate training as has been shown with the screening and treatment of depression in general practice [34]. Screening for alcohol abuse, which is followed by single session interventions in general practice sessions, has been shown to be remarkably effective [5].

Any system of screening in an occupational setting should be carefully managed to deal with the issues of potential disadvantage and discrimination of those being identified as being at risk. For this reason, there can be under-reporting by individuals who are symptomatic and this should be addressed in the thresholds for determining who should receive a diagnostic interview. A range of psychometric instruments has been trialled in emergency services for the monitoring of the emergence of symptoms. Any screening process should also regularly involve a fixed proportion of people who are asymptomatic also being given a diagnostic assessment to remove the stigma of referral for follow-up. While there are well-established measures from epidemiological research, a range of shorter screening measures have been developed and can be used as long as they are regularly validated against a structured diagnostic interview [35].

Although debriefing has been shown to have no preventative value, a number of organizations continue to use this approach, in the context of peer support systems [36] and Critical Stress Management. The sometimes heated debate around these issues should not distract employers from recognizing the need for support from employees in the aftermath of traumatic events. Screening can provide a setting where individuals are offered general support and preventive health messages and a broad range of occupational issues, such as morale and leadership concerns can be addressed simultaneously.

Signs of possible psychological dysfunction

In many occupational settings, it can be useful if supervisors can detect signs that may indicate that an individual is experiencing some PTSD reactions. The negative impact of traumatic events can manifest in a variety of indirect ways which employers should be alert to.

Increased alcohol use [9]
Interpersonal and/or family conflict [13]
Social withdrawal
Depression [37]
Somatic distress [9]
Performance deterioration [10]

Issues of secondary prevention

A recent case (Burton versus the State of New South Wales [38]) has placed an important obligation on

employers in certain jurisdictions. In this case, the negligence of the employer arose, not from being responsible for the traumatic exposure, which led to the plaintiff's symptoms, but rather the failure to monitor his health and to ensure early treatment. Such a case brings into focus the potential possible gains from early treatment, given the evidence about the availability of a range of effective interventions. Hence, an obligation emerges for an employer to detect individuals who are symptomatic so that treatment can be instigated. Secondary prevention involves early detection and prompt effective intervention [39] that decrease the risk of the emergence of the chronic disease states and the associated disabilities, impairments and social disadvantage. It is in this window of opportunity that the gains from early treatment are most apparent [40]. The aim of effective treatment is to minimize these disabilities before they emerge.

While single-session debriefing or counselling in the immediate aftermath of such events has no direct benefit, [41,42], one indirect consequence of any system providing acute support is that it provides a mechanism for giving information to individuals and confronting some of the issues of stigma that frequently create barriers to care [40]. A practical system of care, which ensures early identification and diagnosis, is central to early treatment. Furthermore, a major risk to a symptomatic individual arises from further exposures and a critical responsibility of an employer is to prevent further injury by the worker's continued exposure through his/her duties.

Employers need to recognize that there is a responsibility to follow current scientific evidence in developing any intervention that aims to reduce post-traumatic psychological impairment. In the US Supreme Court's 1993 decision in Daubert versus Merrell Dow Pharmaceuticals, Inc. [43], it was ruled that admissible evidence needed to satisfy specific scientific standards. This ruling has resulted, to varying degrees, in courts ruling that employers are negligent [44,45] if they are not aware of current knowledge about evidence-based interventions [3,4]. In the context of managing early interventions to emergency service personnel who require assistance, there is now considerable evidence that secondary prevention of civilians within a month of trauma exposure can markedly limit PTSD reactions. Using cognitive behaviour therapy, Bryant *et al.* [46] have demonstrated over a series of controlled trials that early intervention leads to more than half of people who would otherwise develop PTSD recovering from the condition.

While several studies have compared the benefit of early versus late treatment and have not shown any adverse consequences of delay [47,48], these studies were inadequate to answer this question. However, a significant body of knowledge based on observational studies and basic biological research argues that early treatment is likely to prevent the underlying neurobiological mechanisms becoming increasingly resistant to modulation and control because delayed treatment allows the processes of progressive sensitization and kindling. The literature about the benefits of early treatment in depression provide parallel evidence for this challenge [27,49,50] because >50% of individuals with a PTSD at some point will have a co-morbid major depressive disorder and as outlined above depression is not an infrequent consequence of trauma exposure.

Conclusion

The predictable risk from traumatic exposure and the many barriers to care pose a particular challenge in the management of traumatic events in the workplace. Optimally, an occupational health service should identify and manage the risks at an organizational level as well as providing readily accessible evidence-based treatment in a timely manner to those individuals identified to be symptomatic. There is remarkably little literature examining screening, monitoring and the effectiveness of evidence-based treatments in different occupational groups.

The absence of direct studies in occupational settings means that there is a critical need for research in these populations. Nonetheless, there is considerable indirect evidence to shape the practice of employers so that evidence accrued from civilian and military settings may form the basis of risk assessments, monitoring practices and interventions.

Funding

NHMRC programme grant number 300304 held by A.C.M. and R.A.B.

Conflicts of interest

None declared.

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