



Invited Review

# Traumatic stress within disaster-exposed occupations: overview of the literature and suggestions for the management of traumatic stress in the workplace

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## Abstract

**Background:** Many people who experience a disaster will do so as part of an occupational group, either by chance or due to the nature of their role.

**Sources of data:** This review is based on literature published in scientific journals.

**Areas of agreement:** There are many social and occupational factors, which affect post-disaster mental health. In particular, effective social support—both during and post-disaster—appears to enhance psychological resilience.

**Areas of controversy:** There is conflicting evidence regarding the best way to support trauma-exposed employees. Many organisations carry out post-incident debriefing despite evidence that this is unhelpful.

**Growing points:** Employees who are well supported tend to have better psychological outcomes and as a result may be more likely to perform well at work.

**Areas timely for developing research:** The development and evaluation of workplace interventions designed to help managers facilitate psychological resilience in their workforce is a priority. Successful interventions could substantially increase resilience and reduce the risk of long-term mental health problems in trauma-exposed employees.

**Key words:** disasters, / mental health, / organisations, / trauma

## Background

Over recent years there has been an increase in the reporting of major emergencies such as disease outbreaks, natural and man-made disasters and terrorist attacks.<sup>1</sup> These events are often unpredictable and can be extremely distressing for those affected. Whilst the majority of research in this area focuses on individual responses to trauma, a growing body of literature explores the impact of trauma at the group level, such as on those who experience trauma as part of their occupational group.

Many occupational groups are at increased risk of exposure to traumatic events—for example, disaster relief and recovery workers, emergency services and military personnel, healthcare professionals and media workers working in conflict zones or at the scene of disasters. Occupational groups such as social workers and therapists are also frequently exposed to trauma vicariously and can experience distress themselves as a result.<sup>2</sup> But even those in occupations who are not routinely exposed to trauma can find themselves affected by traumatic events in the workplace—such as accidents, fires, natural disasters or terrorist attacks—either by chance or because of secondary roles such as first responders. Trauma exposure as a result of experiencing singular traumatic events is known as Type I Trauma, and it is this kind of trauma which those in commercial organisations or other roles not routinely exposed to trauma are most likely to experience. Chronic exposure to multiple traumatic events over time is known as Type II Trauma<sup>2</sup> and this can affect those in roles who are frequently exposed to traumatic incidents, such as emergency service workers. The chronic exposure involved in Type II Trauma can lead to complex post-traumatic stress disorder (C-PTSD) or post-traumatic stress disorder (PTSD); those with C-PTSD are unlikely to be able to continue in a trauma-prone role. Researchers have also differentiated between Secondary Traumatic Stress,<sup>3</sup> the development of PTSD symptoms caused by indirect exposure to the trauma, and Vicarious Traumatization,<sup>4</sup>

referring to the psychological changes which can be experienced as a result of empathising with a traumatised victim.

If employees' psychological wellbeing is negatively affected by their experience of trauma, this can have far-reaching effects on their health, personal lives, productivity at work and the lives of those close to them. It is therefore important for organisations to consider how prepared they are for traumatic events, the possible impact of such an event on staff wellbeing and productivity and how staff could be supported in order to minimise the risk of mental health problems. Organisations also have a duty of care to their employees under health and safety legislation. Furthermore, given the media, public and regulatory interest in traumatic events, how organisations prepare for, mitigate, respond and recover from incidents may affect their reputation as well as make them vulnerable to prosecution for failure to exercise their legal duty of care and civil claims for injury from staff. Within the mitigation phase organisations and, when provided, their occupational health services should consider how the risk of psychological sequelae might be reduced among first responders. Contingency plans should also identify the specialist psycho-social support services that might be used during the recovery phase. Emergency services and hospitals should consider the same measures as part of their medical contingency planning. A 'screen and treat' approach may be beneficial in protecting the mental health of trauma-exposed employees, though further evidence on the outcomes and cost effectiveness of such programmes is needed.<sup>5</sup>

## Impact of exposure to trauma at work

Most often, exposure to trauma does not lead to serious long-term psychological consequences and many who experience distress following a traumatic incident will recover within a few weeks, without intervention.<sup>6</sup> However, it is inevitable that a

minority of people exposed to trauma will develop mental health problems such as depression, anxiety, alcohol problems or PTSD.

Some studies of occupational groups frequently exposed to trauma have found remarkably low levels of mental health problems post-disaster, such as a study of police who dealt with the aftermath of the Madrid bombings,<sup>7</sup> which found that only 1.2% were affected by post-traumatic stress 5-12 weeks after the incident. However, other studies have reported higher rates of mental health problems in such occupational groups: for example, a study of rescue workers exposed to an air crash<sup>8</sup> found that thirteen months post-incident, 16.7% reported PTSD and 21.7% reported symptoms of depression. It has been suggested<sup>9</sup> that occupations such as healthcare providers, fire-fighters, police and those working in search-and-rescue or body recovery are at risk of a wide range of post-traumatic reactions ranging from sub-clinical emotional symptoms such as fear to severe PTSD. A systematic review of the prevalence of PTSD among rescue workers<sup>10</sup> concluded that rescue workers have a much higher prevalence of PTSD than the general population.

It is also possible for those frequently exposed to trauma in their roles to experience vicarious traumatisation,<sup>11</sup> perhaps due to feeling a sense of identification with those they are helping, or experience post-traumatic symptoms as a result of exposure to multiple traumas over time.<sup>12</sup> Overall it appears that the prevalence of post-traumatic mental health problems in trauma-exposed employees varies widely, suggesting there are many factors other than traumatic exposure itself which influence how individuals respond to exposure to traumatic events.

### Factors associated with post-disaster mental health

A meta-analysis<sup>13</sup> identified several predictors of PTSD and symptoms in adults: prior trauma, prior psychological adjustment, family history of psychopathology, perceived life threat during the trauma, post-trauma social support, peri-traumatic emotional responses and peri-traumatic dissociation. A number of systematic reviews have also been

carried out to identify factors which have an impact on the post-disaster psychological wellbeing of trauma-exposed employees in various occupational groups such as humanitarian relief workers,<sup>14</sup> disaster responders,<sup>15</sup> healthcare workers<sup>16</sup> and organisations who are not routinely exposed to trauma but who experience a disaster through chance.<sup>17</sup> Various factors identified by these reviews are summarised below.

### Pre-disaster life events and mental health

Significantly stressful pre-disaster life events, including personal traumas (e.g. divorce and bereavement) or exposure to previous occupational traumatic incidents, appear to be a risk factor for poor mental health post-disaster. Studies have reported that the risk of probable mental health problems increases with an increasing number of significantly stressful pre-disaster life events.<sup>18</sup> Past history of mental health problems is also important, with various studies suggesting that having past mental health diagnoses significantly increases the likelihood of reporting mental health symptoms post-disaster.<sup>19,20</sup>

### Traumatic exposure

Rates of distress tend to be higher among those with high traumatic exposure during the incident, such as those who witness serious injury and death<sup>21,22</sup> and those with repeated exposure to traumas.<sup>2</sup>

### Tasks

Having to carry out roles outside of one's usual remit during a disaster also appears to negatively impact mental health, presumably due to feeling unprepared and subsequently uneasy in those roles. For example, PTSD has been reported to be higher in employees having to provide supervision when not usually in a leadership role<sup>23</sup> and, in those having to perform tasks, they are not normally required to, such as police officers fighting fires and fire-fighters performing construction duties.<sup>24</sup> Other tasks carried out during a disaster appear to be associated with mental ill health, such as de-prioritising victims as part of triage to make best use of available

resources or manpower, handling residents' complaints and being involved in crowd control without appropriate training.<sup>25–27</sup>

### Perceived risk to the self

There also appears to be a relationship between post-disaster wellbeing and perceived personal safety (or lack of) during the disaster. In a study of utility workers deployed to the World Trade Center disaster<sup>19</sup> subjective perception of danger to the self was the single best predictor of PTSD. The duration of the perceived risk to oneself appears to be correlated with the overall number of adverse psychological outcomes experienced.<sup>28</sup> One study<sup>29</sup> found that pre-disaster worries about personal safety (rated retrospectively) were predictive of PTSD, while feeling concerned about the quality of safety equipment and inadequate safety measures predicted anxiety.

### Injury to the self

Having a near-death experience or being seriously injured during the disaster has been associated with subsequent mental health problems in many occupations, such as military rescue workers,<sup>21</sup> Pentagon staff after the 9/11 attacks<sup>22</sup> and recovery workers.<sup>24</sup> However, it may well be that being injured causes people to fear for their life which, as above, has been found to be a particularly strong risk factor. For instance, other evidence suggests that cognitive factors (e.g. thinking one was going to die) are considerably more predictive of poor post-incident mental health than the severity of injury.<sup>30</sup>

### Injury or death of close others

Having family, colleagues or close others injured or killed has also been associated with poor mental health outcomes, such as PTSD, depression, panic attacks and anxiety in Pentagon staff following 9/11<sup>22</sup>; PTSD in military rescue workers<sup>21</sup>; and PTSD and depression in police.<sup>27</sup> One study of fire-fighters exposed to the World Trade Center disaster used a checklist screening tool and reported an incremental increase in PTSD risk for each additional death of a colleague.<sup>23</sup> Another study used a self-administered

questionnaire and reported that loss of a co-worker led to a near 4-fold increase in elevated PTSD.<sup>31</sup>

### Impact of the incident on life post-disaster

The greater the impact of the incident on the employees' lives, the more likely they appear to be affected by psychological problems.<sup>14,15</sup> Property loss in particular appears to be associated with distress.<sup>25,29,32</sup> Needing aid or financial assistance post-disaster appears to be associated with PTSD,<sup>33</sup> while income reduction and financial loss appear to be associated with psychological disorders such as anxiety.<sup>34</sup> A qualitative study<sup>35</sup> of general practitioners and nurses after earthquakes in New Zealand in 2010 and 2011 found that they faced various challenges after the incidents such as increased workload (often with reduced resources) and changes in role or working hours. The healthcare professionals in this study also cited housing and insurance difficulties as major stressors affecting their patients.

### Post-disaster life events

Those who experience significant life events post-disaster also appear to be more likely to develop symptoms of mental health problems; this has been noted in fire-fighters<sup>32</sup> and public sector and union office workers.<sup>36</sup> In the latter study, scores for non-specific psychological distress were 48.5% higher for people who reported four or more life events relative to those who reported none. These studies, and those from the section above, suggest that the post-incident environment has considerable impact on whether someone goes on to develop trauma-related mental health difficulties or not.

### Social support

There is a great deal of literature to suggest that social support is a major factor affecting post-disaster mental health.<sup>14–17</sup> While a good level of social support tends to be associated with lower risk of mental health problems,<sup>37</sup> low social support has been associated with PTSD, anxiety and depression.<sup>38</sup> In terms of occupational relationships, negative work culture perceptions and poor supervisor support have been

associated with mental health symptoms in healthcare workers exposed to the severe acute respiratory syndrome (SARS) outbreak<sup>37</sup> and PTSD in fire-fighters,<sup>20</sup> while poor workplace communication has been reported to significantly increase the risk of mental distress in public servants affected by an earthquake.<sup>25</sup> In a study of Red Cross volunteers,<sup>29</sup> lack of organisational support in the disaster aftermath combined with a high need for support which was not being met was the strongest contributor of depression.

### Coping strategies

Negative coping strategies, such as avoidance or denial—that is, the deliberate avoidance of traumatic thoughts—appear to be associated with poorer mental health.<sup>14</sup> For example, one study of doctors and nurses reported that denial as a method of coping was associated with psychiatric morbidity and that post-traumatic stress symptoms were associated with increased use of behavioural disengagement.<sup>39</sup>

In terms of positive coping mechanisms, ‘proactive coping’, confrontive coping and planned problem-solving have been shown to significantly reduce the effect of trauma on general psychiatric morbidity in rescue workers.<sup>14</sup> The use of venting, humour and acceptance have also been shown to be inversely related to PTSD symptoms for doctors and nurses,<sup>39</sup> with black or gallows humour being recognised as having therapeutic value for coping with traumatic events.<sup>40</sup>

### Supporting trauma-exposed employees

The main area of controversy within the organisational trauma literature concerns the ways of supporting those exposed, particularly in the days and weeks post-disaster.

Occupational groups routinely exposed to trauma at work—such as military and emergency services personnel and disaster workers—are likely to have various support systems in place and be prepared for how to support staff in the event of an emergency. Dunn *et al.*<sup>6</sup> have published guidelines for trauma-exposed

organisations, encouraging preparatory mental health briefings prior to any traumatic incident occurring, within organisation monitoring of staff psychological wellbeing and the supporting of colleagues. However, organisations not expecting to be exposed to trauma at work are unlikely to have similar preparations in place and, even within regularly trauma-exposed organisations, there is still some debate as to what is best practice regarding how to support employees.

Psychological debriefing or ‘critical incident stress debriefing’, conducted by mental health professionals soon after the event, is frequently used post-incident to allow employees to discuss the event and their feelings towards it. While this type of debriefing was designed specifically to prevent the development of PTSD and similar symptoms, there is little evidence that it is effective. A small number of studies have suggested that psychological debriefing reduces anxiety, depression and PTSD symptoms, but these studies generally do not include a control group to determine whether this recovery is in fact due to the intervention, and so do not provide good evidence that debriefing can help.<sup>41</sup> One study<sup>42</sup> found that debriefed participants had lower levels of anxiety, depression and ‘traumatic stress’ than a control group; however, this study was not a randomised controlled trial and did not take into account any other variables which may potentially have affected mental health. In fact, the majority of high-quality research suggests that debriefing is at best ineffective and at worst harmful,<sup>43</sup> and one particular study<sup>44</sup> found that participants who had a group stress debriefing showed less improvement in PTSD symptoms and significantly higher symptoms of common mental distress than those who received no debriefing. One controlled trial of debriefing<sup>45</sup> did not find debriefing to be harmful and found improvements in alcohol use and self-rated ‘quality of life’; however, there was no evidence of debriefing being effective in terms of preventing post-traumatic stress or non-specific psychological distress. A systematic review of early interventions for PTSD concluded that not only did debriefing not prevent PTSD, it may interfere with the natural recovery process and actually increase the likelihood of PTSD.<sup>46</sup> As a result, the National Institute for Health and Care Excellence

(NICE) recommends in its guidelines<sup>47</sup> that debriefing sessions focusing on experiences during the trauma should not be part of routine practice. Nonetheless, the recommendation of debriefing continues to be made, contrary to NICE guidelines—most recently, for example, in UK College of Police guidelines.<sup>48</sup>

It is unclear how useful other early psycho-social interventions may be; there is limited evidence for interventions such as memory-structuring interventions, psychoeducation and self-help,<sup>46</sup> but some evidence that psychological first aid or cognitive-behavioural therapy shortly after experiencing trauma can be beneficial.<sup>9,46</sup> The latest NICE guidelines<sup>47</sup> do state that early treatment for clinically significant PTSD symptoms within the first month can be useful. However in cases where symptoms are not severe, rather than a debriefing or any type of immediate mental health-led intervention in the initial aftermath of the trauma, NICE recommend a period of ‘active monitoring’, previously referred to as ‘watchful waiting’<sup>47</sup> in the first month following exposure to a traumatic incident. Evidence shows that the majority of people will recover within this period without needing formal interventions. However, if substantial symptoms of distress persist after this time point, formal mental health assessment and possibly treatment may be required. There is mixed evidence on what kind of intervention is most successful for employees who have experienced the trauma together. Worksite crisis sessions, cognitive-behavioural therapy and psychoeducation appear to have had positive results,<sup>41,46</sup> but more substantial evidence from randomised controlled trials is needed to ascertain the effectiveness of these. Different interventions may be effective for different types of trauma. Further research on this is needed as currently there has been little exploration of how treatment effectiveness varies according to trauma type.

During the period of ‘active monitoring’, it is important that employees are well supported—managers have a duty of care to protect the wellbeing of their employees, and supporting staff will benefit both the employees themselves and the organisation as a whole—but managers themselves may be unclear about what they should be doing to support their staff.

Knowing the risk factors for post-disaster mental health problems (e.g. stressful life events, injury to the self or others, perception of danger, social support available) would allow managers to identify who is most vulnerable. Similarly, knowing the symptoms of mental health problems such as PTSD would allow them to recognise signs of distress in their workforce. Therefore, it is essential that managers who support employees who are at risk of exposure to trauma at work are educated so that they can understand and recognise mental health problems within their teams.

As positive coping strategies appear to be useful in enhancing resilience, it would be useful for managers to be trained to understand the most effective coping methods, so they could encourage positive strategies in their staff and discourage negative strategies such as avoidance.

Reducing stigma is also important as people may be reluctant to seek help or to tell anyone else that they are struggling. For example, studies of military personnel suggest that those struggling with mental health difficulties may be reluctant to come forward for fear of being seen as weak or as incapable of performing their roles.<sup>49</sup>

It is important to note that many of the ‘risk factors’ identified can be influenced, for better or worse, by managers in particular. For example, performing tasks outside of the usual remit appears to be a risk factor, but managers can ensure this process goes as smoothly as possible by ensuring access to training beforehand (where possible), allocating tasks carefully and giving clear directions to employees to avoid role confusion. Similarly, perceived risk to the self appears to be a risk factor, and while the unpredictable nature of disasters means that managers cannot control the danger an employee might feel themselves to be in, they can minimise this by ensuring that safety equipment is suitable, effective and properly maintained and that safety procedures are in place and understood by all employees. Managers could have a substantial influence on the resilience of their staff; for example, by ensuring that staff have received adequate emergency response training; providing and fostering good levels of support for their employees as well as encouraging a positive workplace atmosphere and good relationships within teams; and encouraging

positive coping mechanisms or recommending staff to attend coping workshops designed to encourage the use of positive coping strategies and reduce the use of negative strategies. A cluster randomised controlled trial of mental health training for managers within an Australian fire and rescue service found that the manager mental health training programme led to a significant reduction in the work-related sickness absence of employees.<sup>50</sup>

There is evidence within regularly trauma-exposed organisations to suggest that peer support interventions such as Trauma Risk Management (TRiM),<sup>51</sup> designed to develop psychological support systems within teams in the workplace, has been successful in improving employees' ability to support their colleagues and reducing stigma around mental health problems.<sup>52</sup> Some of the elements of TRiM, such as training to recognise symptoms and risk factors and training on how to psychologically support colleagues, could be incorporated into a training package for employees of other, not regularly trauma-exposed organisations in order to prepare them for the event of a disaster. Guidelines for good practice in the management of stress at the team level<sup>6,53</sup> advocate the ongoing monitoring of staff and the use of informal peer support programmes such as TRiM to protect the wellbeing of employees.

It is generally accepted that poor psychological wellbeing is associated with poor work performance; for example, presenteeism has been found to be associated with stress and poor mental health.<sup>54</sup> If managers could take the steps outlined above to enhance the psychological resilience of their workforce, then as well as having a positive impact on employee wellbeing this may also result in better performance at work. We acknowledge that there may be practical difficulties involved in managers taking the steps we have outlined here; future research should target whether these suggestions are implementable in practice in order to ascertain whether they are (a) realistic and (b) effective.

## Discussion/conclusions

Many people are exposed to traumatic events, such as disasters and major incidents, as part of their occupation—either by chance or due to the nature

of their role. While most staff will recover fully from the incident without formal psychological intervention, a minority will experience long-term psychological problems. Those most likely to be psychologically affected appear to be those: with prior psychiatric history or stressful life events pre-disaster; with high levels of exposure to the incident; tasked with difficult roles or roles outside of their usual remit during the incident; who felt in serious danger during the incident; who were injured; who knew someone killed or injured in the event; whose personal or professional lives were impacted as a result of the disaster; who experienced stressful life events post-disaster; lacked social support; and had poor coping strategies such as avoidance and denial.

Despite there being reasonable evidence about how trauma-exposed organisations can support their staff, unfortunately psychological debriefing continues to be used despite evidence that it is unhelpful. Evidence strongly suggests that managers should be educated to understand the symptoms of, and risk factors for, the more common mental health problems post-disaster (such as depression, anxiety and PTSD). This will allow them to identify and support more vulnerable staff and recognise those who may be suffering. Managers should encourage positive coping mechanisms such as confrontive coping and exercise rather than negative coping mechanisms such as denial and avoidance. Furthermore, personnel who experience persistent psychological difficulties should be helped to access professional support. This may be best achieved through provision of appropriate education, reduction of stigma and provision of timely access to evidence-based care provided in accordance with the NICE guidelines.

## Conflict of interest statement

N.G. runs a psychological health consultancy, which provides Trauma Risk Management training among other services.

## Disclaimer

The authors are affiliated to the National Institute for Health Research Health Protection Research

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