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Long-term effects of traumatic stress

Mark Creamer and David Forbes

It is now generally accepted that exposure to potentially life-threatening events, as well as to the death or suffering of others, will contribute to the development of psychiatric problems in a proportion of survivors. Such experiences, of course, are common during military deployments associated with both combat and peacekeeping. Fortunately, by no means all of those people who experience trauma will go on to develop psychiatric sequelae; of those who do, many will recover over the first few months following the deployment. Nevertheless, the development of long-term posttraumatic mental health problems is a major issue for defence forces around the world, with serious implications for performance, readiness to deploy, premature discharges and resignations, and compensation. The purpose of this chapter is to review our current state of knowledge regarding the mental health sequelae of military deployments.

Although this chapter will focus on research findings following deployments, it is important to emphasise that much posttrauma psychopathology in military populations may result not from deployments but from other non-operational traumatic events. These may include motor vehicle and training accidents, as well as physical and sexual assaults. The prevalence of psychiatric problems following such events has been well documented in civilian populations (see Breslau, Davis, Andreski & Peterson, 1991; Kessler et al., 1995) and there is little reason to suppose that rates among military personnel would be markedly different. Thus, it would be a mistake to

assume that the recognition and management of posttrauma reactions in the military should be confined solely to deployed troops.

The nature of posttraumatic mental health problems

Posttraumatic stress disorder

In considering the nature of psychological sequelae to trauma, the first disorder to be considered is posttraumatic stress disorder, or PTSD. As noted in previous chapters, PTSD was first accepted into the diagnostic literature in 1980. Subsequent revisions of the *Diagnostic and Statistical Manual of Mental Disorders* have modified the criteria, the latest version being DSM-IV (American Psychiatric Association, 1994).

Not surprisingly, the first criterion to be met for a diagnosis of PTSD is experience of a traumatic event. DSM-IV places a heavy emphasis on physical threat to the self or others, as well as the presence of clear distress at the time of, or following, the trauma. The second group of criteria covers re-experiencing of the event in some form. These intrusive memories of the incident—being haunted by past horror—are central to the phenomenology of PTSD. Recurrent and distressing memories, dreams, acting or feeling as if the event were recurring, and psychological distress or physical symptoms when reminded of the trauma characterise these re-experiencing phenomena.

These intrusive symptoms are extremely distressing and result in states of high arousal. In an attempt to prevent the re-experiencing phenomena, the person is likely to avoid any reminders of the trauma and, in more severe cases, show a pervasive numbing of general responsiveness. The numbing symptoms are central to the diagnosis of PTSD, differentiating it from more common, but less pathological, psychological responses to trauma. The final cluster of symptoms are those of persistently increased arousal, characterised by sleep disturbance, anger and irritability, poor concentration, hypervigilance, and exaggerated startle response.

In line with other DSM-IV diagnoses is the requirement that the disturbance must cause significant distress or functional impairment. Indeed, in its more chronic forms, the disorder has a major impact on the person's relationships and social networks, as well as the ability to function effectively in occupational settings.

Comorbid conditions

PTSD is routinely associated with comorbidity. Epidemiological studies suggest that around 90 per cent of individuals with chronic PTSD also meet

criteria for another psychiatric disorder (Kessler et al., 1995), and this figure may be even higher among veterans. Kulka and his colleagues (1990), for example, reported that 98 per cent of Vietnam veterans with PTSD had, at some stage, qualified for another DSM-IIIR diagnosis. In addition to comorbidity, there is little doubt that PTSD is not the only mental health problem that may develop following exposure to trauma. In a prospective study, Shalev, Freedman et al. (1998) noted an 18 per cent prevalence of PTSD in a sample of 211 trauma survivors. However, 5 per cent of the sample developed 'pure' major depression (with no evidence of PTSD) and 9 per cent developed a 'pure' anxiety disorder other than PTSD. Thus, clinicians working with military personnel who have been exposed to trauma should be alert to the possibility of other psychiatric disorders that may be present either together with PTSD or in isolation.

One of the most common posttraumatic conditions occurring with and without PTSD in military populations is substance abuse and dependence. Traditionally, the drug of choice in Australia has been alcohol, although anecdotal evidence suggests that this may be changing among younger veterans to include drugs such as marijuana, cocaine, and amphetamines, as well as 'designer drugs' such as MDMA ('ecstasy'). Not surprisingly, substance abuse and dependence have a major impact on the individual's ability to function effectively in military and civilian settings. The other most common condition following trauma is depression. This also may occur with PTSD or in isolation. Depression is characterised not only by dysphoric mood, but also by loss of interest in normal activities, disturbance of sleep and appetite, loss of energy, psychomotor agitation or retardation, feelings of worthlessness or guilt, poor concentration, and suicidal ideation. Anecdotal evidence suggests that depression, particularly of an agitated nature, is often misdiagnosed or missed altogether.

It is not uncommon following trauma to see the development of anxiety disorders other than PTSD. These include panic disorder (with or without agoraphobia), social phobia, simple phobia, obsessive compulsive disorder, and generalised anxiety disorder. With a potentially major impact on social and occupational functioning, these conditions may render the person incapable of continuing in a military career.

The prevalence of war-related psychiatric problems

The 1990s saw a proliferation of literature documenting the psychological effects of military service, particularly relating to combat deployments. A thorough review of the literature is beyond the scope of this chapter. However, the interested reader is referred to the work of Schlenger and his

colleagues (Schlenger, Fairbank, Jordan & Caddell, 1999) for a review of studies relating to combat-related PTSD. The following summary is divided into three sections according to time period (before, during and after the Vietnam War) with an additional section on peacekeeping deployments.

Before the Vietnam War

Prior to the introduction of diagnostic manuals such as DSM and International Classification of Diseases, it was hard to be definitive about the nature, prevalence, and severity of psychiatric morbidity. Instead, reliance was placed upon anecdotal reports and clinical impressions. Thus, our knowledge of the psychiatric sequelae of conflicts before the Vietnam War is of limited reliability. Nevertheless, there can be no doubt that psychiatric casualties were as much a part of warfare in the past as they are today, if not more so, and literature through the ages is replete with descriptions.

The scope of the problem during World War I was considerable, with the British Army reporting that 7–10 per cent of officers and 3–4 per cent of other ranks suffered 'mental breakdowns'. Over 80 000 shell-shocked troops passed through the army hospitals, with around 20 000 ending up in psychiatric institutions. Around 200 000 soldiers were exempted from further active service on the basis of a shell shock diagnosis (Gersons & Carlier, 1992). It can only be speculated how many of these would have warranted a diagnosis of PTSD under today's terminology.

Following World War II, several studies have reported on the psychiatric aftermath of combat and prisoner-of-war experiences during that conflict. In particular, the years since have provided an opportunity to examine the course of traumatic stress reactions over the lifespan. In a long-term follow-up of 188 American former prisoners of war, Kluznik, Speed, Van Valkenburg, and Magraw (1986) found that 67 per cent had a history of PTSD following their imprisonment, with 24 per cent showing moderate PTSD symptoms forty years later and 8 per cent showing severe symptoms. More recently, Sutker and her colleagues (1993a) reported current PTSD prevalence rates of 18 per cent for US combat veterans of World War II and 70 per cent for former prisoners of war.

Despite variations in prevalence across studies, these figures are of great importance in contributing to our knowledge about the long-term course of PTSD, sometimes spanning up to fifty years since the trauma. There is no doubt that many veterans of World War II, currently in their seventies and eighties, are suffering symptoms of traumatic stress associated with their wartime experiences. Anecdotal evidence suggests that the ageing process is sometimes associated with the appearance of symptoms in individuals who

may have coped remarkably well until their later years. It may be speculated that traumatic memories from the war have been reactivated as these elderly veterans are confronted with their own death and the loss of friends and loved ones.

Although studies of other conflicts before the Vietnam War are rare, there is no reason to assume that rates of psychiatric morbidity would be markedly different. In a small study of American prisoners of war from the Korean conflict, for example, Eberly and Engdahl (1991) found a PTSD lifetime prevalence of 53 per cent.

The Vietnam War

It was not until the Vietnam War that combat-related psychiatric morbidity was studied intensively and systematically. Indeed, the inclusion of PTSD as a diagnostic category in DSM-III was, in part, a result of this work, as well as an impetus for its continued development. Although many studies have investigated the mental health of Vietnam veteran populations, this brief review will focus only on two of the most influential.

The most comprehensive evaluation of the mental health of Vietnam veterans comes from the National Vietnam Veterans Readjustment Study (Kulka et al., 1990). This study, initiated by a US Congressional mandate, investigated the prevalence of postwar problems in 1632 Vietnam veterans. They found a lifetime PTSD prevalence of 31 per cent for men and 27 per cent for women, with current rates of 15 per cent for men and 9 per cent for women. These figures are important in understanding the chronicity of the disorder—half of those Vietnam veterans who have ever had PTSD still have it today, thirty years later. Importantly, the study also identified high rates of other psychiatric disorders in the veteran sample. Around 40 per cent of the sample met criteria for alcohol abuse or dependence, 17 per cent for depression, and 16 per cent for another anxiety disorder. These rates were very much higher in those individuals with a diagnosis of PTSD—around 75 per cent of those with PTSD, for example, met criteria for alcohol problems.

An Australian study by Brian O'Toole and his colleagues (1996b) produced only slightly lower rates of PTSD. Investigating a random sample of 641 Australian Vietnam veterans using a structured clinical interview, that study found lifetime PTSD rates of around 21 per cent, with current rates around 12 per cent. Prevalence of other disorders was remarkably similar to the National Vietnam Veterans Readjustment Study, with alcohol abuse or dependence at 41 per cent, depression at 25 per cent, and other anxiety disorders at 13 per cent.

Many other studies have found similar rates of psychiatric problems in other Vietnam veteran samples. The impact of this psychopathology on social and occupational functioning cannot be underestimated.

After the Vietnam War

Considerable research has been conducted on the mental health of Israeli veterans, much of it by Zahava Solomon and her colleagues. A particular contribution of this body of research has been to emphasise the importance of acute combat stress reactions in the subsequent development of long-term problems such as PTSD. For example, those researchers studied 382 combat soldiers who had experienced acute stress reactions and compared them with a matched sample of 334 soldiers who did not experience acute stress reactions (Solomon, Weisenberg, Schwarzwald & Mikulincer, 1987). One year after the war, rates of PTSD in the first group were around 59 per cent, compared with only 16 per cent in the second group. While a discussion of acute stress disorder (ASD) and combat stress reaction (CSR) is beyond the scope of this chapter, their importance in identifying those at risk of future problems is critical to effective interventions.

The Persian Gulf War provided another opportunity to examine the effects of combat on mental health. Several studies have investigated the prevalence of PTSD and related conditions in deployed US troops, with rates ranging from a low of 4 per cent (Wolfe, Brown & Kelley, 1993) to a high of 19 per cent (Sutker, Uddo, Brailey & Allain, 1993) depending on the specific population of interest. Other researchers (Wolfe et al., 1993) have demonstrated that this psychiatric morbidity is not limited to PTSD, but includes a broad range of psychosocial dysfunction.

With the construct of PTSD well established, studies during the 1990s were able to take advantage of methodological developments to conduct longitudinal and prospective research. For example, Southwick et al. (1995) conducted a longitudinal study of US Gulf War veterans at one, six, and twenty-four months following their return, reporting a PTSD prevalence of 10–13 per cent at two years. Importantly, the prevalence of PTSD in this sample increased over time, raising questions about the possibility of delayed onset (or, at least, delayed reporting) of combat-related PTSD.

Peacekeeping

The increased deployment of combat troops on peacekeeping missions has been a relatively recent phenomenon. Although the primary goal may be keeping the peace, it is clear that many of these missions share similarities with combat deployments, including threat to life and exposure to the

death and suffering of others. They also have the added complexities and ambiguities of placing combat troops in situations in which they are bound by strict rules of engagement and in which they are often unable to use the fighting skills in which they were trained.

One of the first epidemiological studies of the prevalence of PTSD among peacekeepers was conducted by Litz, Orsillo and their colleagues (1997). Investigating 3461 troops who served as part of a US force in Somalia, Litz found a PTSD prevalence of around 8 per cent shortly after their return. Examining 117 Australian troops on the same deployment, Ward (1997) found increased levels of psychological morbidity on the General Health Questionnaire which persisted through to a 15-month follow-up. Unfortunately, no formal diagnosis of PTSD was made, although the author noted that up to 20 per cent of veterans reported 'PTSD symptoms'. As peacekeeping missions become increasingly common, additional studies on the psychological aftermath will undoubtedly be published. In the meantime, there is sufficient evidence to suggest that the psychiatric sequelae of peacekeeping missions cannot be ignored. The potential implications for predeployment screening and preparation, and for postdeployment screening and early intervention, are considerable.

Risk factors and vulnerability

Although rates of psychiatric problems following military deployments are high enough to be of great concern, they are by no means universal. The fact remains that the majority of individuals who are deployed on combat or peacekeeping missions seem to adjust remarkably well to the experience and do not suffer long-term problems. Thus, a knowledge of risk factors and vulnerability has important implications in terms of primary and secondary prevention strategies. Again, a thorough review of this area is beyond the scope of this chapter, which provides only a brief overview. The interested reader is referred to more detailed texts such as Yehuda (1999).

When the concept of PTSD was first introduced, it was assumed that the experience of trauma was the prime, if not the only, etiological factor. Indeed, it was almost politically incorrect to suggest that survivors who went on to develop psychiatric morbidity such as PTSD were, in some way, vulnerable. To do so was interpreted as blaming the victim. The field has progressed significantly since that time and it is now recognised that the trauma is a necessary, but insufficient, explanation for the development of PTSD. However, severity of the trauma remains a central component of the etiology and it is reasonable to assume that the potential impact of other risk factors varies according to the severity of the stressor. Following highly

traumatic events, it may be that personal characteristics and other risk factors are of little importance—the event itself is sufficient to explain the onset of psychiatric sequelae. Following more minor traumatic events, however, risk factors become of increasing importance in helping to explain why some people, and not others, develop subsequent adjustment problems. For the purposes of this discussion, vulnerability factors are discussed in three broad domains: before, during and after the trauma.

Pre-trauma factors

In terms of pretrauma vulnerability factors, research examining demographic factors has been conflicting, with few clear trends emerging. However, there is some evidence to suggest that poor education and low income may be associated with a slightly increased risk of PTSD (Kessler et al., 1999; Wolfe et al., 1993). Interestingly, married men may be at higher risk than unmarried men (Kessler et al., 1999), although those who are separated or divorced may also be vulnerable (Wolfe et al., 1993). There is now clear evidence that females may be more vulnerable than males to the development of PTSD following exposure to trauma among both civilian (Breslau, Davis, Andreski, Peterson & Schultz, 1997) and military populations (Wolfe et al., 1993). Although this may be explained in part by a reluctance on the part of males to report symptoms, it may also be a function of trauma type. Anecdotal evidence would suggest that females are more likely than males to be victims of violence perpetrated by someone they know, resulting in greater disruption of long-held beliefs relating to trust, safety, and intimacy. Females are more likely also to be victims of sexual harassment and rape (in some cases perpetrated by colleagues within the military; Wolfe et al., 1998). Rape is a trauma that consistently results in a high incidence of PTSD in both males and females (Kessler et al., 1995).

Several studies have suggested that prior psychiatric history, or a preexisting tendency towards anxiety and depression, may be a vulnerability factor in the development of PTSD (Blanchard et al., 1996; McFarlane, 1988; Rothbaum, Foa, Riggs, Murdock & Walsh, 1992). The question of prior trauma experience is complex. It is possible that, at certain levels, prior life stress may help to inoculate the individual to subsequent stress, providing an opportunity to learn and practise coping skills and to develop more flexible internal models of the self and the world that can incorporate future trauma more readily. Some support for this suggestion was provided by Ruch and Leon (1983), who found a curvilinear relationship between prior life stress and adjustment to rape. Those survivors with both very high and very low levels of prior life stress fared worst, with those who had experienced moderate levels doing best. However, the bulk of research suggests

that a prior history of trauma, particularly childhood physical and sexual abuse, constitutes an important vulnerability factor in the development of PTSD following subsequent trauma in both military (Engel et al., 1993) and civilian (Breslau, Chilcoat, Kessler & Davis, 1999) populations.

Recent research has been increasingly interested in the construct of 'hardiness'. Several studies with military populations have found this factor to be an important predictor of subsequent adjustment following trauma (Bartone, Ursano, Wright & Ingraham, 1989; King et al., 1999). These findings, along with research on the role of personality (Schnurr & Vielhauer, 1999), raise the possibility that effective screening at recruitment may serve to reduce the prevalence of postdeployment psychiatric morbidity.

Peri-trauma factors

With regard to the characteristics of the event itself (peri-trauma variables), research has consistently shown the severity of the trauma to be a critical factor in subsequent adjustment (Kessler et al., 1995; Kulka et al., 1990; Litz, King, King, Orsillo & Friedman, 1997). More severe events are characterised by factors such as a high degree of life threat, longer duration, complexity, and exposure to the suffering of others. A more general notion of harsh or malevolent environment (such as the jungles of Vietnam) has also been demonstrated as a predictor (King et al., 1995). An important caveat, however, is that several studies have suggested that perceived life threat during the trauma may be a stronger predictor of subsequent adjustment than the actual level of threat (Blanchard et al., 1995; Creamer et al., 1993).

Although research on the peri-traumatic factors associated with the development of PTSD following peacekeeping missions is still in its infancy, several factors are beginning to emerge. Litz, King and their colleagues (1997) noted that traditional combat and negative aspects of peacekeeping (including malevolent environment) were important predictors of poorer adjustment. Importantly, however, the authors found that the need to restrain the use of force when faced with potentially life-threatening circumstances (something that is quite unique to this type of deployment) was strongly associated with the negative aspects of peacekeeping.

The individual's reaction at the time of the trauma is also a potential risk factor or, at least, a marker for future adjustment problems. Work by Bryant, Harvey, Guthrie and Moulds (2000) and Shalev, Sahar et al. (1998) suggests that elevated arousal (as indicated by increased heart rate immediately following the trauma) and dissociation at the time of the incident may be two separate pathways to the subsequent development of PTSD. Clearly, both should be the focus of future prospective studies aimed at improving recognition and early intervention in acute traumatic stress.

Posttrauma factors

Finally, posttrauma factors may moderate the development of the disorder and facilitate the recovery process. Although only a few studies have investigated this aspect in military populations (King et al., 1998; Chapter 10), the available research among civilians suggests that good social support (Creamer et al., 1993; Green, 1996) and stress management skills (Foa, Rothbaum, Riggs & Murdock, 1991) may assist recovery from trauma. It is probable that both of these posttrauma factors assist the victim in managing the distress associated with confronting the traumatic memories (Creamer, 1993), reducing the likelihood of prolonged cognitive and behavioural avoidance. Anecdotal evidence suggests that cultural attitudes towards the event, and the extent to which the experience is validated by the person's social networks, may be important also in facilitating the recovery process. Support for this hypothesis among military personnel is provided by the negative homecoming experiences of many Vietnam veterans, which are consistently associated with subsequent PTSD (Fontana & Rosenheck, 1994; Grayson, Marshall, Dobson & O'Toole, 1996).

Conclusions

There is now an overwhelming body of evidence to suggest that military deployments, both combat and peacekeeping, are associated with subsequent psychiatric morbidity in a significant minority of personnel. Although PTSD has been the most studied disorder, it is clear that problems are not limited to this diagnosis. Rather, problems of depression, substance abuse, and other anxiety disorders have been noted in many studies and across many military populations. The impact of this psychopathology on broader areas of social and occupational functioning, particularly in the context of a continuing military career, is likely to be considerable.

On the positive side, defence forces around the world have recently begun to acknowledge the potential for psychological damage inherent in any deployment. Predeployment screening and psychological preparation are now becoming routine, not only within the Australian military but also within defence forces across the world. It is now increasingly common for psychiatric teams to be deployed with fighting or peacekeeping units, improving the chances of early recognition and intervention in acute psychiatric cases. Postdeployment debriefing strategies and mental health screening is being implemented to varying degrees in many countries. Thus, although there is a long way to go, progress is being made in minimising the negative psychological impact on the men and women who serve in our defence forces.