Posttraumatic Stress Disorder (PTSD) and its effects in Vietnam veterans: The New Zealand experience

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Previous research investigating the readjustment of Vietnam veterans clearly demonstrates PTSD as a major outcome of exposure to combat. It is also clear that in veterans PTSD is associated with a range of mental health, physical health, and social functioning problems. Much of the previous research concerned with PTSD in Vietnam veterans has been generated in the United States, and although there has been some work with Australian veterans, the degree to which New Zealand veterans have suffered similar consequences has received little attention. This paper is concerned with PTSD in combat veterans and presents a mini-review of key research, focusing on mental health, physical health, and interpersonal functioning. The paper proceeds to a general discussion of major findings from two community surveys of New Zealand Vietnam veterans which investigated the current health and mental health status of New Zealand Vietnam veterans, and examined in detail the effects of PTSD in these veterans. Consistent with overseas research, a notable proportion of New Zealand veterans suffer from symptoms of PTSD, and in these veterans, PTSD is associated with high levels of anxiety, depression, chronic illnesses, severe somatic symptoms, complex interpersonal functioning problems, and low levels of positive psychological well-being.

As long as soldiers have been risking their lives in combat it is likely that there have been many who have been unable to meet the considerable demands which the task and conditions of battle have placed upon them. The long-term nature of stress reactions were particularly apparent with veterans of the Vietnam war and the consequent psychological adjustment of these veterans has received extensive attention. In particular, an extensive body of research has been generated around the concept of posttraumatic stress disorder (PTSD) (DSM-IV; American Psychiatric Association, 1994).

Within DSM-IV, PTSD is listed as an anxiety disorder on Axis I alongside disorders such as panic disorder, agrophobia, and generalised anxiety disorder (American Psychiatric Association, 1994). The essential feature of PTSD is the development of characteristic symptoms following exposure to an extreme trauma. This may involve direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one's personal physical integrity; or witnessing an event that involved death, injury or a threat to the physical integrity of another person; or learning about unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or other close associate. In addition, the person's response to the event must involve intense fear, helplessness, or horror. The characteristic symptoms resulting from the exposure to the extreme trauma include persistent re-experiencing of the traumatic event, persistent avoidance of stimuli associated with the trauma and general numbing of responsiveness, and persistent symptoms of increased arousal.

Since the introduction of PTSD as a diagnostic entity, a great deal has been written about the history, etiology, epidemiology, effects and treatment of the disorder, and although PTSD may develop following a range of traumatic events, much of the work has been concerned with the disorder in combat veterans, especially those from Vietnam.

Prevalence of PTSD in Vietnam veterans

It is difficult to accurately determine the number of veterans with PTSD as prevalence rates vary according to sampling methods and assessment instruments used. In a large epidemiological study (Centers for Disease Control, 1988a), approximately 15% of Vietnam veterans experienced combat-related PTSD at some time during or after military service, and 2% reported the disorder during the month prior to examination. Similarly, Eisen, Goldberg, True & Henderson, (1991) found that 17% of Vietnam veterans had current PTSD, the same rate reported by Green and her colleagues (Green, Grace, Lindy & Gleser, 1990a). Findings from the most recent epidemiological study of Vietnam veterans indicate that 15% of the men and 9% of the women who served in Vietnam suffer from PTSD (Schlenger et al., 1992). These rates were significantly higher than the

maximum rate of 2.5% reported for control groups of Vietnam generation peers.

The prevalence rates reported for community samples of veterans are lower than the rates reported for veterans with high combat exposure and lower than rates reported for clinical samples of veterans. These rates range from 25% to 70% for veterans exposed to high levels of combat (Kulka et al., 1990; Oei, Lim & Hennessy, 1990) and between 24% and 68% for clinical samples of veterans (Blake et al., 1990; Green et al., 1990a).

Risk factors

Previous research findings indicate that combat stress, particularly the duration and intensity of combat exposure, is the factor most consistently associated with the development of PTSD symptoms in veterans (Buydens-Branchey, Noumair & Branchey, 1990; Cordray, Polk & Britton, 1992; Fontana & Rosenheck, 1993; Green et al., 1990a). Other aspects of military service, related to combat exposure, have also been associated with the development of PTSD. Soldiers at greater risk of developing the disorder include: those who were engaged on special assignment duties, such as reconnaissance behind enemy lines (Green, Lindy, Grace & Gleser, 1989); those in tactical military occupational specialties, such as infantrymen and artillery crewmen (Centers for Disease Control, 1988a); those who assisted with casualty treatment (O'Brien & Hughes, 1991); those who had friends killed or missing in action (Chemtob et al.,1990; O'Brien & Hughes,1991); and those who were physically wounded (Buydens-Branchey et al.,1990; Chemtob et al.,1990).

A number of studies have reported that elevated levels of PTSD are associated with witnessing or participating in abusive violence (Fontana & Rosenheck, 1993; Gallers, Foy, Donahue & Goldfarb, 1988; Yehuda, Southwick & Giller, 1992). Green and her colleagues found that extent of injury, loss, life threat, and injuring or killing civilians predicted the development of PTSD, while special assignment and exposure to grotesque death were more predictive of symptoms over an extended period of time (Green et al., 1990a). Similarly, Yehuda et al. (1992) concluded that the enduring effect and severity of PTSD symptoms are associated more with exposure to brutal death and suffering than the threat of death associated with combat.

Although combat exposure is a critical variable in the development of PTSD, it does not account completely for the incidence of the disorder. A number of studies have examined the role of pre-military and post-military factors in the development of combat-related PTSD. Veterans with poorer social relationships prior to service have been shown to be more likely to develop PTSD (Chemtob et al.,1990; Helzer, Robins & McEvoy,1987; Wilson & Krauss,1985). PTSD has also been associated with a lack of emotional preparedness to leave the unit or service, failure to discuss feelings upon return from Vietnam (Chemtob et al., 1990), as well as lower levels of general intelligence (McNally & Shin, 1995).

In terms of postcombat transition, several factors have been identified as influential. These include the immediate nature of military discharge, perceived helpfulness of veterans' families on return from Vietnam, isolation at homecoming, and family stability (Frye & Stockton, 1982; Wilson & Krauss, 1985). Vietnam veterans who are members of minority groups, such as Hispanics and Blacks, also appear to be more at risk of psychological maladjustment than their white counterparts, with non-white veterans reporting significantly higher levels of postwar stress (Centers for Disease Control, 1988a; Green, Grace, Lindy, Gleser, & Leonard 1990b; Kulka et al., 1990) .

Although a wide range of factors have been identified as risk factors in the development of PTSD, studies examining the relative importance of pre-service, combat, and post-service variables in explaining the development and persistence of PTSD have demonstrated that while non-combat factors may be important, current PTSD symptomatology is most strongly related to combat stressors (Cordray et al., 1992; Fontana & Rosenheck, 1993; Green, Grace, Lindy, Gleser, & Leonard, 1990c). It has been argued, for example, that factors such as ethnicity, age, and pre-service adjustment have an indirect effect on the development of PTSD through their relationship with war stressors (Cordray et al.,1992; Green et al ., 1990c) . Supporting this argument, Fontana and Rosenheck (1993) conclude, from a study of treatment-seeking Vietnam veterans, that while both premilitary vulnerabilities and war zone traumas have a causal role in the development of PTSD, premilitary vulnerabilities play a secondary role. Further research of this type is required to unravel the complex set of factors associated with the development of PTSD in trauma survivors, and to clarify the relative importance of, and interaction between factors.

PTSD and concurrent diagnoses

Previous research concerned with the occurrence of concurrent diagnoses in PTSD shows that, in veterans, PTSD is associated with a range of mental health, physical health, and social functioning problems. Veterans rarely have PTSD alone. As many as 96% (Green et al., 1990c), 94% (Roszell et al., 1991), and 84% (Sierles et al., 1986) of veteran samples have been reported as having at least one other diagnosis in addition to PTSD. In a comprehensive epidemiological study of Vietnam veterans, lifetime rates of concurrent diagnoses were found to be as high as 98.9% (Kulka et al., 1990) .

Veterans with PTSD frequently experience other mental health problems in conjunction with the disorder. Most commonly these include major depression or manic disorder, other anxiety disorders and substance abuse (Green et al., 1990c; Jordan et al., 1991; Kulka et al.,1990). The co-occurrence of generalised anxiety disorder with PTSD is frequently reported, with levels ranging from 2 to 20% (Boudewyns, Albrecht, Talbert & Hyer,1991; Centers for Disease Control, 1988a; Davidson, Kudler, Saunders & Smith; 1990; Green et al., 1990b; Jordan et al., 1991; Kulka et al., 1990). Concurrent levels of depression have been reported at between 3% and 20% in PTSD samples (Centers for Disease Control, 1988a; Davidson et al., 1990; Green et al., 1990b; Jordan et al., 1991; Kulka et al., 1990). Other affective diagnoses which have been associated with PTSD include antisocial personality, phobic disorder, atypical

psychoses, and intermittent explosive disorder (Boudewyns et al., 1991; Escobar et al., 1983; Green et al., 1990b). Reported levels of alcohol abuse range from 33% (Boudewyns et al.,1991; Centers for Disease Control, 1988a) to 76% (Sierles et al.,1986) whilst drug abuse has been reported at levels from 4% to 44% (Boudewyns et al., 1991; Keane, Geraldi, Lyons & Wolfe, 1988). In a samples of treatment-seeking veterans, PTSD was has also been associated with a range of personality disorders, including borderline, obsessive-compulsive, avoidant, and paranoid personality disorders (Boudewyns et al., 1991; Southwick, Yehuda & Giller, 1993).

Individuals with PTSD are also likely to have poor physical health (Litz et al.,1992; Shalev, Bleich & Ursano, 1990). In general, combat veterans are more likely than non-veterans to report illness, hospitalisations, medication use, minor disabilities, and are more likely to engage in negative health behaviours related to tobacco and alcohol use (Centers for Disease Control, 1988a; Waigandt, Evans & Davis,1986). In studies of combat veterans, PTSD veterans report more physical health problems, or somatic symptoms, than control groups (Centers for Disease Control Vietnam Experience Study, 1988b; Litz et al., 1992; Shalev et al., 1990; Solomon & Mikulincer, 1987; White & Faustman, 1989). Recent studies suggest, however, that Vietnam veterans are not at greater risk of developing chronic conditions, such as hypertension, diabetes, or ischemic heart disease (Litz et al., 1992; Mainous & Bertolino, 1993).

Given the concurrent mental and physical health difficulties associated with PTSD, it is not surprising to find that PTSD is also associated with a range of social adjustment problems (Kulka et al.,1990). PTSD veterans have been shown to have less effective interpersonal problem solving skills than those without the disorder, and they are more likely to report interpersonal relationship difficulties, particularly in the areas of intimacy, sociability, and hostility (Nezu & Carnevale,1987; Roberts et al., 1982). Compared with families of veterans without current PTSD, families of PTSD-veterans report high levels of marital and family dysfunction, problems in parenting skills, elevated levels of family violence, and low levels of family expressiveness and cohesiveness (Carroll et al., 1985; Jordan et al., 1992; Kulka et al.. 1990: Solomon. Mikulincer. Freid & Wosner. 1987).

The New Zealand Vietnam veteran with PTSD

A study completed in 1991 reported, for the first time, comprehensive details of the current health and mental health status of 573 New Zealand Vietnam veterans, and examined in detail the effects of PTSD in these veterans (Long, Chamberlain & Vincent, 1992; Vincent, Chamberlain & Long, 1991). The results of that study showed that while the majority of veterans were functioning well for their age, there was a notable proportion (12%) who reported high levels of PTSD symptomatology, and these veterans were significantly worse off than their non- PTSD counterparts on all dimensions of physical and mental health outcomes which were assessed (Vincent et al.,1991). In these veterans, higher levels of PTSD were significantly related to higher levels of daily stress and psychological distress, more severe somatic symptoms, more contact with health care professionals, lower self- rated health, and lower levels of psychological well-being.

Following on from that survey, a second study was undertaken which aimed to replicate these findings and to extend our understanding of the effects of PTSD on Vietnam veterans. The second study provided a development of the previous research in two ways: it involved a larger sample of veterans (756), including many of those who had participated in the earlier research; and it incorporated several more specific and relevant measures of physical and mental health. It expanded on the previous research by investigating the interpersonal functioning of veterans, and examined how this related to PTSD (Chamberlain, Vincent & Long, 1994; Vincent, Chamberlain, & Long, 1994b) .

The results of the extended study clearly replicated the earlier research findings and supported findings from overseas research. Veterans were classified as PTSD cases using their score on the Mississippi Scale for PTSD (Keane, Caddell & Taylor, 1986). Although it is acknowledged that the optimal approach to the assessment of PTSD is to use a multiaxial approach, the Mississippi Scale is widely used and has been shown to be a reliable and valid instrument for the identification of combat-related post-traumatic stress disorder symptoms in Vietnam combat veterans (Litz et al.,1992; Watson,1990; Watson et al.,1994). Using a cut-off of 102, recommended by Watson (1990) as most suitable for community surveys, 10% (74) of the veterans were identified as PTSD cases. Employing the same procedure, the previous study classified 12% (71) of the veterans as suffering from PTSD (Vincent et al., 1991). This level is similar to United States community veteran surveys which have reported current PTSD prevalence levels of between 15 and 19% (Centers for Disease Control, 1988a; Jordan et al.,1991; Kulka et al., 1991; Schlenger et al. , 1992) .

Veterans who were classified as suffering from PTSD differed substantially in many respects from their non-PTSD peers. A summary of the major findings is presented in Appendix 1. In terms of demographic variables, PTSD cases had significantly lower educational qualifications and incomes, and had been involved in significantly more long-term relationships than non-PTSD cases. They were also twice as likely to be divorced or separated than were non-PTSD cases.

In terms of military experience there were fewer differences between PTSD cases and non-PTSD cases. The length of time veterans spent in Vietnam was unrelated to PTSD level, but PTSD cases were significantly more likely to have held lower ranks while in Vietnam and to have spent less total time in military service than non-PTSD cases. They also reported significantly higher levels of combat exposure during their time in Vietnam. Given this difference it is perhaps surprising that we did not find significant differences between the groups in terms of the nature of their combat duties (active combat, combat support, administrative and other), or their military specialisation (infantry, artillery, other) during the tour of duty.

Previous research has shown that combat experience, and in particular, the duration and intensity of combat, have an important role in the development of PTSD (Buydens-

Branchey, Noumair & Branchey, 1990; Cordray, Polk & Britton, 1992; Fontana & Rosenheck, 1993; Green et al., 1989; 1990a). This was also the case with the New Zealand veterans, with combat exposure being the strongest predictor of later PTSD (Vincent, Chamberlain, & Long, 1994a). The results from the New Zealand sample of veterans also support the argument that the relationship between PTSD and variables such as ethnicity, age, and pre-service adjustment is mediated through the effects of war stressors (Cordray et al., 1992; Fontana & Rosenheck, 1993; Green et al., 1990c; Kulka et al., 1990). Results suggest that the race effects found in the 1991 study were an artifact of military experience variables. When these were controlled, the relation of race to PTSD was no longer significant (MacDonald, Chamberlain, & Long, 1995) .

When mental health outcomes were examined in the New Zealand veterans, PTSD cases were significantly worse off that their non-PTSD counterparts, reporting significantly higher levels of anxiety and depression, and significantly lower levels of psychological well-being. Consistent with other recent findings showing that PTSD veterans are likely to have several co-occurring mental health problems (Escobar et al., 1983; Green et al., 1990c; Jordan et al., 1991; Keane & Wolfe, 1990; Kulka et al., 1990), very few PTSD cases (6%) experienced PTSD without symptoms of other mental health disorders (Long, Vincent & Chamberlain, 1995). In these veterans, moderate to high levels of anxiety and depression were commonly associated with PTSD, frequently simultaneously.

PTSD cases were also significantly worse off than non-PTSD cases in terms of their physical health. These veterans reported almost twice as many chronic illnesses, substantially more days lost to health disability, considerably lower self-rated health status, and substantially higher severity of symptoms. While the specific symptoms reported by the two groups were similar, PTSD cases reported their symptoms as much more severe than non-PTSD cases (Chamberlain et al., 1994). This pattern of poor health outcomes was virtually identical to that reported for PTSD cases in our earlier research (Long et al., 1992), and was replicated with a completely new sample, as health measures were completed only by first-time respondents. In the earlier study, PTSD cases also reported making more contacts with health care professionals than non-PTSD cases (Long et al., 1992).

The New Zealand findings confirm previous research showing that veterans with PTSD experience more symptoms (Litz et al., 1992; Shalev et al., 1990; Solomon & Mikulincer,1987). The results also extend our knowledge of health-related PTSD effects by providing a comprehensive account of the type of symptoms and illnesses experienced by veterans with PTSD. Although these symptoms generally did not differ from those reported by combat veterans at large (Litz et al., 1992; Long et al.,1992; Centers for Disease Control, 1988b), PTSD cases reported them at very much higher levels of frequency and severity. The findings also support studies which show that PTSD veterans are more likely to have an identifiable medical problem (White & Faustman, 1989), in contrast to studies which suggest that there is not a "Vietnam factor" in the development of chronic physical conditions (Litz et al ., 1992; Mainous & Bertolino, 1993).

In terms of interpersonal functioning, the New Zealand findings again confirm and amplify previous work documenting the problems that veterans with PTSD have in their family functioning (Carroll et al.,1985; Jordan et al.,1992; Kulka et al.,1990; Roberts et al.,1982), marital relationships (Carroll et al.,1985; Jordan et al.,1992; Kulka et al., 1990; Solomon et al., 1987), and in relating to others (Nezu & Carnevale,1987; Roberts et al.,1982). New Zealand veterans with PTSD reported significantly higher levels of interpersonal problems than non-PTSD cases, indicating that they experienced substantial difficulties when initiating and maintaining interpersonal relationships. PTSD veterans also reported lower levels of satisfaction with their intimate relationships and poorer family functioning than non-PTSD veterans. In the light of these results, it was not surprising that PTSD cases were twice as likely to be divorced or separated, and that they had been involved in a larger number of long-term relationships than non-PTSD cases.

Previous research has suggested that PTSD is associated with specific types of interpersonal and family functioning problems (Jordan et al., 1992; Roberts et al., 1982; Solomon et al., 1987). The degree to which this was true for the current sample has been examined and reported elsewhere (MacDonald, Chamberlain, Long & Flett, 1995). In contrast to previous research it is evident that in this sample, veterans with PTSD had substantial interpersonal and family difficulties on every dimension that was assessed, suggesting that the social adjustment problems associated with PTSD are quite qeneral rather than specific and particular.

Conclusion

The results of these studies assist us in compiling a picture of the typical veteran with PTSD. What is most apparent is that, compared to the non-PTSD veteran, the veteran with PTSD has a complex set of problems. He is less well educated and less well off financially. He will have remained in the Armed Forces for a shorter period of time in total, and during his tour of duty in Vietnam, he will have served with a lower rank and experienced more severe levels of combat. In terms of his current mental health status, he has lower levels of psychological well-being, and experiences high levels of anxiety and depression along with his symptoms of PTSD. His current physical health status is considerably poorer; he has more chronic illnesses and acute symptoms, makes more contacts with health care professionals, and rates his health status as poor. He has greater difficulty in his interpersonal relationships, he experiences difficulties relating to others, and he his withdrawn and disengaged from his family. He is likely to have had a series of intimate relationships, to be separated or divorced, and to be less satisfied with his intimate relationships.

Previous research has shown that combat veterans are likely to develop a range of long-term mental health disorders, not least of which is PTSD. Furthermore, it is clear that veterans with PTSD are at greater risk of developing a range of physical health, mental health, and

social functioning problems. The findings from the New Zealand research discussed in this paper support previous research on PTSD in combat veterans, and show that, compared with their overseas counterparts, New Zealand veterans of the Vietnam War have suffered similar consequences as a result of their combat experiences.

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Appendix I:
Comparison of mean scores on major outcome variables for PTSD cases and non-cases[a].

Variable	PTSD case	Non-PTSD case	F
Demographic			
Age (years)	49.40	50.86	3.40
Educational level	1.97	2.44	6.67***
Gross annual Income ($000's)	30.42	40.24	5.26*
Weekly paid employment (hrs)	43.51	45.29	1.02
Number of relationships	1.77	1.28	20.83***
Military Experience			
Time in Vietnam (months)	11.22	11.06	0.09
Highest rank in Vietnam	2.12	3.19	16.64***
Years of military service	9.94	15.16	17.16***
Combat exposure	26.61	22.16	33.08***
Mental Health			
Anxiety	58.77	37.21	191.92***
Depression	21.71	7.32	131.50***
Positive well-being	45.06	67.65	80.64***
Interpersonal Functioning			
Interpersonal Problems	198.04	121.05	23.69***
Family Functioning	107.68	112.86	7.14**
Dyadic Adjustment	16.04	19.36	24.16***
Physical Health			
Symptom severity	87.24	38.06	17.49***
Chronic illness	4.30	2.59	27.53***
Days of disability	20.69	4.41	51.34***
Self-rated health	3.86	5.07	53.16***

* p < .05
** p < .01
*** p < .001
Ns vary: PTSD cases, 43-74; non-PTSD cases, 355-672.

[a] Data summmarised from Chamberlain, Vincent & Long, 1994