



Research paper

The impact of antecedent trauma exposure and mental health symptoms on the post-deployment mental health of Afghanistan-deployed Australian troops



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A B S T R A C T

Background: Both traumatic deployment experiences and antecedent traumas increase personnel's risk of developing PTSD and depression. However, only cross-sectional studies have assessed whether antecedent trauma moderates stress reactions to deployment experiences. This study prospectively examines whether antecedent trauma moderates the association between deployment trauma and post-deployment PTSD and depressive symptoms after accounting for antecedent mental health problems, in a large Australian Defence Force (ADF) sample.

Methods: In the ADF Middle East Area of Operations Prospective Study, currently-serving military personnel deployed to Afghanistan across 2010–2012 ($n = 1122$) completed self-reported measures at pre-deployment and post-deployment.

Results: Within multivariable regressions, associations between deployment trauma and PTSD and depressive symptoms at post-deployment were stronger for personnel with greater antecedent trauma. However, once adjusting for antecedent mental health problems, these significant interaction effects disappeared. Instead, deployment-related trauma and antecedent mental health problems showed direct associations with post-deployment mental health problems. Antecedent trauma was also indirectly associated with post-deployment mental health problems through antecedent mental health problems. Similar associations were seen with prior combat exposure as a moderator.

Limitations: Antecedent and deployment trauma were reported retrospectively. Self-reports may also suffer from social desirability bias, especially at pre-deployment.

Conclusions: Our main effects results support the pervasive and cumulative negative effect of trauma on military personnel, regardless of its source. While antecedent trauma does not amplify personnel's psychological response to deployment trauma, it is indirectly associated with increased post-deployment mental health problems. Antecedent mental health should be considered within pre-deployment prevention programs, and deployment-trauma within post-operational screening.

1. Introduction

Various studies demonstrate that combat-related deployments and concomitant trauma are associated with higher prevalence of probable mental disorder, including post-traumatic stress disorder (PTSD) and depression (Fear et al., 2010; Hoge et al., 2006, 2004; Iversen et al., 2008; Sareen et al., 2007). Other studies suggest that antecedent traumatic experiences can also affect post-deployment mental health (Cabrera et al., 2007; Clancy et al., 2006; Dedert et al., 2009; Fritch

et al., 2010; Kelley et al., 2013; King et al., 1996; Phillips et al., 2010; Sareen et al., 2013; Stein et al., 2005; Van Voorhees et al., 2012). This is consistent with cumulative trauma being associated with increased disorder risk (Breslau et al., 1999; Copeland et al., 2007; Kessler, 2000; Nelson et al., 2011).

However, the small number of studies investigating how antecedent trauma affects the relationship between deployment-related trauma and mental disorders show conflicting results. Four of these studies suggest antecedent trauma make personnel more vulnerable to post-

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deployment disorder (King et al., 1996; Kuo et al., 2012; Solomon and Flum, 1988; Woodward et al., 2013), while three suggest personnel experiencing antecedent trauma are more resilient (Cabrera et al., 2007; Owens et al., 2009; Stein et al., 2005), and the remaining three found no interaction effects (Fritch et al., 2010; Sareen et al., 2013; Van Voorhees et al., 2012). Even relatively comparable studies find different effects: for example, two cross-sectional US studies with large sample sizes both modelled continuous interaction terms between childhood trauma and combat exposure counts, and their association with self-reported PTSD symptoms, however one found a significant ‘vulnerability’ interaction (Cabrera et al., 2007), whereas the other found no interaction (Van Voorhees et al., 2012). A critical limitation of all of these studies is their cross-sectional design, and thus their inability to adjust for antecedent mental health; this is problematic because (1) personnel’s mental health may already be affected by antecedent trauma prior to deployment, and (2) this antecedent mental health is associated with mental health at post-deployment (Davy et al., 2012; Dickstein et al., 2010; Smid et al., 2013; Vasterling et al., 2010).

A plausible hypothesis is that antecedent trauma may not moderate the association between deployment trauma and subsequent mental health problems after accounting for an indirect effect through antecedent symptoms. Instead, civilian research suggests that antecedent mental health problems may act as a moderator (Breslau et al., 2008). This study found that antecedent trauma *in combination with* antecedent PTSD was associated with significantly higher risk of PTSD following a subsequent trauma, but there was not a significant risk associated with antecedent trauma in the absence of PTSD. This prospective study highlights the need to include antecedent mental health when considering the association between trauma and post-deployment psychological morbidity.

Moreover, these equivocal findings may be due to methodological and/or design limitations. Cross-sectional studies might bias the recall of antecedent trauma, and a temporal association between antecedent trauma and post-deployment mental health cannot be established. Additionally, many studies are limited by small and potentially biased samples including treatment-seeking veterans, where prior trauma is likely over-represented (King et al., 1996; Kuo et al., 2012; Stein et al., 2005; Woodward et al., 2013).

Several military studies that employ prospective designs are able to examine these constructs prior to and following the most recent deployment (e.g., Heesink et al., 2015; Riddle et al., 2007). In particular, one notable military study has prospectively explored similar interactive vulnerability effects (Smid et al., 2013). In Dutch combat soldiers returned from Afghanistan, the positive association between post-deployment stressors (e.g., divorce, financial problems) and increase in PTSD symptoms across 2 years post-deployment was significant for soldiers with higher deployment trauma levels, whereas there was no association for soldiers with lower deployment trauma levels. The prospective design allowed this study to adjust for early life trauma and prior mental health. However, an interaction between antecedent symptoms and deployment trauma (the question of interest in this paper) was not examined.

It is also important to explore indirect associations between antecedent trauma and post-deployment mental health through prior mental health, as personnel repeatedly exposed to environmental risk may not simply experience elevated post-deployment symptoms, but rather may progressively recruit greater symptoms at pre- and then post-deployment (Davy et al., 2012; Dickstein et al., 2010; Smid et al., 2013; Vasterling et al., 2010). However, while several prospective military studies include all these variables within models (e.g., Seelig et al., 2012; Smid et al., 2013), they do not appear to have explicitly tested such mediated associations.

Finally, it appears that no prospective research has examined whether *prior combat exposure* specifically moderates the association between recent deployment-related trauma and post-deployment mental health problems. Generally, number of deployments has been

examined as a predictor of disorder (Adler et al., 2005b; Kline et al., 2010; Phillips et al., 2010; Reger et al., 2009; Rona et al., 2007) rather than prior combat exposure, which is more predictive of subsequent problems than deployment per se (Fear et al., 2010; Seelig et al., 2012; Smith et al., 2008; Wells et al., 2010). Given the recent prevalence of repeated deployments, it is important to ascertain whether previously-deployed personnel with prior combat exposure are particularly at risk following deployment-related trauma.

The aim of this study was to determine whether antecedent trauma, antecedent mental health problems (i.e., PTSD/depressive symptoms) or previous combat exposure moderated (i.e., amplified/reduced) the association between deployment trauma and post-deployment mental health problems in a large prospective sample of Afghanistan-deployed Australian veterans. Given the conflicting findings regarding interactive effects, and as we could also adjust for antecedent PTSD/depressive symptoms, we examined the null hypothesis – i.e., that there would be no interaction between antecedent and deployment trauma after adjusting for antecedent PTSD/depressive symptoms. Our study addresses a major limitation in the literature by using a prospective design, and assessing antecedent mental health. Our design has the added advantage of including various traumas assessed prior to the current Afghanistan deployment (including prior combat exposure), and both PTSD and depressive symptoms as outcomes.

2. Method

2.1. Participants

The sample was drawn from the Middle East Area of Operations (MEAO) Prospective Health Study (Davy et al., 2012), which assessed the physical and mental health of Australian Defence Force (ADF) members deploying on Operation SLIPPER (Afghanistan) after June 2010, and returning by June 2012. All deploying personnel had been deemed mentally and physically fit to deploy (ramifications of this ‘healthy warrior’ sample are considered within the discussion). While 3074 ADF members deployed during this period and thus were eligible, due to the extensive training commitments and short lead-up time associated with many deployments, not all personnel could be approached for participation. Thus, personnel from 13 units and a Navy ship were approached, as were individuals deploying into Coalition units. Within 4 months prior to deploying (the ‘antecedent’ assessment), 1871 ADF members (60.9% of all deployed) participated. As security/logistic reasons prevented us from individually identifying everyone attending briefings and being invited, this 60.9% can be considered as the absolute minimum response rate. Of these, 1324 (70.8% retention rate) also participated within 4 months following their deployment (the ‘subsequent’ assessment), and 1122 personnel completed all data fields (i.e., had no missing data).

Participants spanned all ranks and Services, and included Special Forces (who were unidentifiable, and classified under Army Service), and full-time reservists.

2.2. Measures

Fig. 1 provides a schematic assessment schedule relative to the current Afghanistan deployment.

2.2.1. Demographic variables (antecedent assessment)

Sex, Service and rank came from military records. Participants reported their age, educational qualifications, regular/reservist status, and prior deployment status. Ranks were grouped into: other ranks (Private to Corporal equivalents), non-commissioned officers (Sergeant to Warrant Officer equivalents) and commissioned officers (Lieutenant to General equivalents).

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