Adverse combat experiences, feeling responsible for death, and suicidal ideation in treatment-seeking Veterans and actively serving Canadian Armed Forces members

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ABSTRACT

Introduction: The present study examines the relationship between feeling responsible for the death of another and suicidal ideation (SI) while controlling for post-traumatic stress disorder (PTSD), major depressive disorder (MDD), and general adverse deployment experiences. **Methods:** Participants were current and former Canadian Armed Forces personnel ($N = 276$) seeking treatment at a hospital-based operational stress injury clinic. Data was collected as part of a standard intake protocol. **Results:** Although 43.5% of the sample reported feeling responsible for the death of another in at least one instance, this variable did not emerge as a significant predictor of SI. Instead, MDD and PTSD severity were the only significant predictors of SI in our model. **Discussion:** Consistent with previous research, MDD emerged as the strongest predictor of SI. Results emphasize the influence of psychiatric conditions on suicidal behaviour over and above other combat-related variables.

Key words: combat, deployment experiences, major depressive disorder, military personnel, post-traumatic stress disorder, suicidal ideation

RÉSUMÉ

Introduction : L'étude suivante examine la relation entre le sentiment d'être responsable du décès d'un autre et l'idéation suicidaire (IS) des patients qui sont en traitement pour l'état de stress post-traumatique (ÉSPT), des troubles dépressifs majeurs et les effets indésirables des expériences de déploiement. **Méthodes :** Les participants étaient des membres actifs ou des vétéran(e)s des Forces armées canadiennes ($N = 276$) qui se sont présenté(e)s à une clinique de stress opérationnelle dans un hôpital pour recevoir des traitements. Les données ont été recueillies lors d'un protocole d'évaluation standardisé à l'admission. **Résultats :** Même si 43.5% des participants ont indiqué un sentiment de responsabilité envers le décès d'un autre, cette donnée n'est pas une variable prédictive significative pour l'IS. Toutefois, la sévérité des troubles dépressifs majeurs et de l'ÉSPT étaient les seules variables prédictives significatives dans notre modèle. **Discussion :** A l'instar de recherches précédentes, le trouble dépressif majeur était la variable de prédictibilité la plus significative pour l'IS. Les résultats nous démontrent l'influence des conditions psychiatriques sur le comportement suicidaire, au-dessus de toute autre variable en relation au combat.

Mots clés : combat, l'état de stress post-traumatique, ÉSPT, expériences de déploiement, idéation suicidaire, personnel militaire, trouble dépressif majeur

INTRODUCTION

Exposure to combat and other events during deployment are associated with an increased risk of developing both post-traumatic stress disorder (PTSD) and major depressive disorder (MDD).[1–4] The association between these psychiatric conditions and suicidal behaviours, such as suicide attempts and suicidal ideation (SI), is well established.[5–7] However, much less is known about the effects of exposure to specific types of trauma during deployment on mental health outcomes such as psychiatric diagnoses

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and suicidal behaviour. In the general population, exposure to traumatic events has been associated with an increased risk of SI and suicide attempts independent of mental health diagnoses, socio-demographic characteristics, and physical disorders.[8] Military deployments, in particular, present the possibility for exposure to a number of potentially traumatic situations, ranging from difficult environmental conditions to witnessing or causing death and/or destruction. Thus, exposure to traumatic events during deployment may help explain the increased rates of suicide that have been reported among military personnel in recent theatres of conflict in Iraq and Afghanistan.[9–12]

However, studies using military samples have produced inconsistent findings regarding the relationship between combat experiences and SI, with some demonstrating an association between combat exposure and SI independent of psychiatric diagnoses[13–16] and others failing to find an association.[17] Accordingly, some have raised doubts as to whether events experienced during deployment provide any unique contributions to suicidal behaviour that cannot already be explained by other mental health conditions or psychosocial variables.[18] In other words, although combat exposure is significantly associated with receiving a diagnosis of PTSD and/or MDD, it is unclear whether combat exposure increases the risk of suicide directly.[17]

A limitation in previous research is the lack of attention to the diversity of situations that one may encounter during deployment. It is possible that there are differential effects of specific types of deployment-related experiences on suicidal behaviour, such that exposure to only specific types of trauma increases the risk of suicidal behaviours. In this vein, previous research has suggested that exposure to trauma that includes the perpetration of harm to another, or a perceived failure in preventing harm to another, may directly increase the risk of suicidal behaviour. For example, in their sample of Vietnam Veterans, Fontana, Rosenheck, and Brett found that killing or failing to prevent death was associated with suicide attempts.[19] Similarly, Belik and colleagues found that although exposure to combat or peacekeeping operations was not significantly associated with increased suicide risk, other deployment-related experiences, such as purposefully injuring, torturing, or killing another person, were significantly associated with suicide attempts in men but in not women.[17] This association was present after controlling for mental disorders and comorbidity. Furthermore, Maguen and colleagues found that Veterans with more killing experiences were twice as likely to experience SI compared to those with little or no killing experiences after controlling for other types of adverse deployment experiences, PTSD, depression, and substance abuse disorders.[20]

Although previous research has found mixed findings with regard to the association between deployment-related trauma exposure and SI, a better understanding of the type of trauma exposure may provide further clarity. Specifically, traumatic events that include the act of killing or the perceived failure to prevent the death of another may contribute to increases in suicidal behaviour. Accordingly, the present study sought to investigate the association between SI and feeling responsible for the death of another within a sample of current and former Canadian Armed Forces (CAF) personnel. Feeling responsible for the death of another reflected both killing experiences as well as mortalities for which an individual felt subjectively responsible. We hypothesized that feeling responsible for the death of another would significantly predict the absence or presence of SI, after controlling for PTSD severity, MDD severity, and adverse deployment experiences.

METHODS

Participants and procedure

The current study used previously collected data from current and former CAF members presenting to an operational stress injury clinic in London, Ontario, between January 2002 and September 2014. At intake, members and Veterans completed a standard screening protocol, which included a number of self-report measures, including the Patient Health Questionnaire (PHQ),[21] the PTSD Checklist – military version (PCL-M),[22] the Deployment Experiences Questionnaire,[23] as well as demographic information. Participants provided informed consent for their information to be entered into an electronic database to be used for research, clinical, and program-evaluation purposes. All data were de-identified. The current study used information provided by members who were deployed at least once, either locally within North America or internationally, and completed the Deployment Experiences Questionnaire ($N = 276$). The current study received approval from the Office of Research Ethics at the University of Western Ontario, Lawson Health Research Institute, and relevant hospital review boards.

Measures

PTSD symptom severity was assessed using the PCL-M.[22] The PCL-M is a 17-item, self-report questionnaire that provides an indicator of PTSD symptom severity based on military-specific traumatic events. Respondents were asked to report how much they have been bothered by 17 different symptoms in the past month on a scale ranging from one ("not at all") to five ("extremely"). Responses were tabulated to provide a total score, with higher values indicating greater symptom severity. As a descriptive measure, we examined the prevalence of probable PTSD using a cut-off score of 50, which is typically used as an indicator of probable PTSD.[22,24] Internal consistency for the PCL-M in the current study was excellent (Cronbach's $\alpha = 0.93$).

MDD symptom severity was assessed using nine items of the PHQ (formally titled the PHQ-9), a brief measure included in the self-administered version of the Primary Care Evaluation of Mental Disorders,[21] which was used to assess depressive symptom severity consistent with the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV*).[25] Respondents rated the frequency and severity of nine symptoms on a scale ranging from zero ("not at all") to three ("nearly every day"). Item scores were summed to provide a total score, with greater scores representing greater symptom severity. Cut-off scores of 5, 10, 15, and 20 represent mild, moderate, moderately severe, and severe depression, respectively. As a descriptive measure, we examined the prevalence of probable MDD using the following algorithm: if respondents endorsed at least five depressive symptoms at a level of "more than half the days" (a score of two) or greater and at least one of the symptoms endorsed was a depressed mood or diminished interest. The item measuring SI, described below, was excluded from both MDD symptom severity and probable MDD calculations. Internal consistency of the PHQ-9 with and without the suicidality item was good (Cronbach's $\alpha = 0.88$ and 0.88 respectively).

SI was assessed using a single item on the PHQ-9. Previous research has used single items as indicators of the absence or presence of SI.[26] Suicidality on the PHQ-9 was defined as an endorsement of "several days" (score of one) or greater to the item asking about suicide ("thoughts that you would be better off dead or of hurting yourself in some way"). When used alone, the suicidality item from the PHQ-9, as defined as an endorsement of "several days" or more, has a demonstrated a sensitivity of 0.84 and specificity of 0.69 when compared to the mood module of the structured clinical interview for *DSM-IV* Axis I Disorders.[27]

Feelings of being responsible for the death of another person and adverse deployment experiences were measured using individual items from a Deployment Experiences Questionnaire, a 30-item, modified version of the Combat Deployment Experiences Questionnaire originally developed by the Walter Reed Army Institute for Research.[28] Respondents reported whether they had experienced each event during their most recent deployment by indicating "yes" or "no." No responses were given a score of zero, and yes responses were given a score of one. Four items on the original scale were removed due to concerns that they might require investigation into potential misconduct (for example, witnessing the mistreatment of non-combatants).

Feeling responsible for death was measured using the sum of three items ("feeling directly responsible for the death of a non-combatant;" "feeling directly responsible for the death of an enemy combatant;" and "feeling directly responsible for the death of a Canadian ally personnel"). Adverse deployment experiences were measured using the sum of the additional 27 items, which represented a range of events that one may have experienced during deployment (that is, being attacked or ambushed, receiving incoming artillery, witnessing an accident that resulted in serious injury or death, being wounded, and so on).

Statistical analyses

Analyses were conducted using Statistical Package for the Social Sciences, version 23.0 (SPSS Inc., Chicago). Correlation analyses were conducted to examine initial patterns of associations and to ensure that the assumption of collinearity was not violated. A logistic regression analysis was used to examine the influence of feeling responsible for the death of another, adverse deployment experiences, PTSD, and MDD on the presence or absence of SI. Pairwise deletion was used to handle missing data so as not to reduce overall power.

RESULTS

Of the 276 participants, the majority were male (93.1%; $N = 257$). The mean age of the sample at intake was 43.4 years (SD = 12.88), and the majority of participants were CAF Veterans (86.2%; $N = 238$). The remaining were still-serving military members ($n = 38$). All members

Table 1. Participant characteristics

Categorical variables	*n*	%
Primary deployment locale		
Afghanistan	84	47.7
Balkan States (former Yugoslavia, Kosovo, etc.)	49	27.8
Africa (Somalia, Rwanda, Sierra Leone, etc.)	22	12.5
Domestic deployment	52	29.5
Measure	***M***	***SD***
PCL-M	58.88	14.61
PHQ-9	16.17	6.48

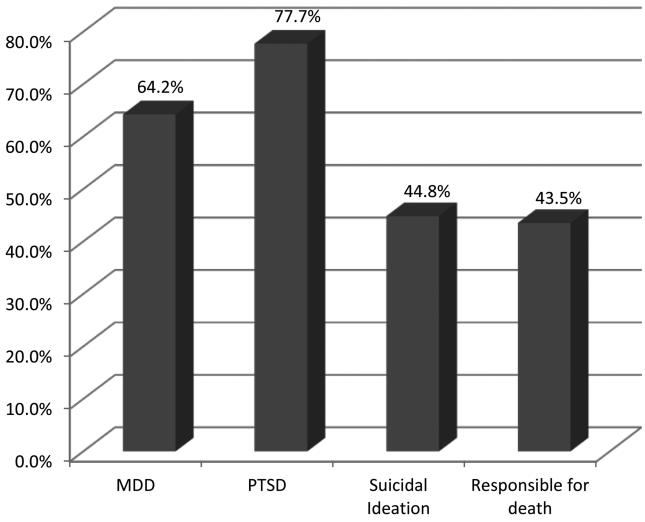

Figure 1. Frequency (%) of self-reported probable MDD, PTSD, SI, and feeling responsible for death

were deployed at least once. On average, members were deployed three times (SD = 2.41). Table 1 presents deployment locales using data from those who disclosed this information ($n = 176$), as well as means and standard deviations for the PCL-M and PHQ-9. Mean scores for the PCL-M and PHQ-9 were above the cut-off for probable PTSD and moderately severe depression, respectively. Frequencies of probable PTSD, MDD, SI, as well as the percentage of individuals who endorsed at least one item relating to feeling responsible for death are presented in Figure 1.

Based on the Deployment Experiences Questionnaire, the top five most frequently reported deployment experiences were: (1) seeing human remains (73.36%), (2) seeing dead and/or injured Canadians (70.91%), (3) knowing someone who was injured or killed (70.91%), (4) being in mined areas with improvised explosive devices (64.48%), and (5) experiencing hostile reactions from civilians (67.39%). In addition, 24.18% reported feeling responsible for the death of an enemy, 21.56% reported feeling responsible for the death of a non-combatant, and 18.4% reported feeling responsible for the death of a Canadian/ally.

Correlation analyses revealed significant associations between MDD and PTSD symptom severity ($r = 0.677$, $p < 0.001$) as well as MDD and SI ($r = 0.377$, $p < 0.001$). PTSD was also significantly correlated with SI ($r = 0.365$, $p < 0.001$), adverse deployment experiences ($r = 0.141$, $p = 0.033$), and feeling responsible for death ($r = 0.196$, $p = 0.002$). Adverse deployment experiences and feeling responsible for death were also significantly correlated with each other ($r = 0.524$, $p < 0.001$); however, neither was significantly correlated with MDD ($p = 0.938$ and $p = 0.098$, respectively) or with SI ($p = 0.844$ and $p = 0.137$, respectively). In the logistic regression equation examining the influence of feeling responsible for death, MDD, PTSD, and adverse deployment experiences on SI, MDD symptom severity emerged as the strongest predictor of SI, followed by PTSD symptom severity (see Table 2). Adverse deployment experiences and feeling responsible for death did not significantly predict SI.

Table 2. Logistic regression predicting SI

	B	*SE*	*df*	*p*	*OR*
MDD symptom severity	0.104	0.037	1	0.006	1.110
PTSD symptom severity	0.034	0.016	1	0.029	1.035
General deployment	−0.052	0.030	1	0.087	0.950
Feeling responsible for death	0.267	0.240	1	0.267	1.306

DISCUSSION

The present study found that nearly half of the individuals in this treatment-seeking sample of Veterans and still-serving CAF members reported feeling responsible for the death of another person in at least one instance. Similarly, the presence or absence of SI (the endorsement of "several days" or greater) was reported in almost 50% of cases. Consistent with previous research, deployment experiences were significantly associated with PTSD.[1–4] Similarly, feeling responsible for death was also significantly correlated with PTSD. However, unlike previous research that found that killing or failing to prevent death was a significant predictor of SI,[14,15] feeling responsible for death did not significantly predict SI, nor was it significantly associated with SI or MDD in correlational analyses. It is important to point out that although feeling responsible for death certainly includes the act of killing, it also includes a more subjective evaluation, such that one may endorse feeling responsible for someone's death in combat without actually killing. As such, the two variables are perhaps not directly comparable.

It is also possible that feeling responsible for the death of another is correlated with other variables that were not assessed and not available in our dataset but that influence the development of MDD and SI. For example, previous research has shown a significant association between guilt and SI within military personnel.[29] It may be the case that the association between feeling responsible for death and variables such as MDD and SI are contingent upon additional variables, such as guilt. Conversely, deployment experiences, including feeling responsible for death, may play an indirect role such that deployment experiences put one at risk for developing PTSD, which exacerbates the risk of MDD, which in turn affects SI.[30]

As demonstrated in a number of previous studies, MDD emerged as the strongest predictor of SI.[26,31–37] Depression symptom severity is one of the most consistent and demonstrable risk factors for suicidal behaviour in both civilian and military populations.[38] Thus, the present study emphasizes the pervasiveness of MDD as a primary risk factor for suicidal behaviour and a target for intervention. There are a number of interventions available that may help mitigate suicide risk among those diagnosed with MDD.[39,40]

Limitations

The current study had several limitations worth acknowledging. Data were collected at a single, specialized tertiary-care clinic from treatment-seeking CAF members and Veterans. Thus, caution should be used when generalizing with respect to other psychiatric or military populations. Additionally, the current study used self-report measures to assess PTSD, MDD, SI, and deployment experiences. It is possible that some participants under- or over-reported symptoms, which may artificially inflate or decrease the statistical significance of the findings reported. However, it bears noting that convergent validity studies on SI have found 80% agreement among self-report measures and clinician ratings of suicidality.[41] Finally, the current study relied on the use of a single item to measure suicidality, and we did not control for other variables known to predict suicidal behaviour, such as previous suicidal behaviour.

Future studies assessing feeling responsible for death and SI among deployed samples, especially in non-treatment-seeking samples, may help clarify the role of trauma on SI. These studies may benefit from using more specific deployment experiences or a less constrictive time line, as the Deployment Experiences Questionnaire specified events experienced during the participant's most recent deployment only. Additional variables, such as guilt or past suicidal behaviour, may provide further insight.

CONCLUSIONS

In this sample of treatment-seeking Veterans and actively serving military members, MDD symptom severity emerged as the strongest predictor of SI, followed by PTSD symptom severity. Neither general adverse deployment experiences nor feeling responsible for death significantly predicted SI, emphasizing the importance of psychiatric conditions on suicidal behaviour over and above other combat-related variables, whose role in the formation of adverse mental health outcomes warrants further attention. No funding was provided for this research.

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COMPETING INTERESTS

None.

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CONTRIBUTORS

Lisa King was responsible for data acquisition and analysis. All authors conceived, designed, researched, and drafted the manuscript and approved the final version submitted for publication.