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# Risk and Protective Factors Associated With Symptoms of Post-Traumatic Stress, Depression, and Alcohol Misuse in OEF/OIF Veterans

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**ABSTRACT** Military personnel returning from the conflicts in Iraq and Afghanistan commonly experience mental health problems and efforts are underway to determine risk and protective factors associated with postdeployment mental health concerns. This study examined the contribution of trait neuroticism, predeployment life events, combat experience, perceptions of threat, and postdeployment social support on mental health symptoms at 6 months, 12 months, and 24 months postdeployment. Two hundred seventy-one veterans completed self-report measures. Hierarchical regression analyses demonstrated that neuroticism predicted post-traumatic stress and depressive symptoms at all 3 time points; perceived threat predicted post-traumatic stress symptoms at Time 1 and Time 2 and depressive symptoms at Time 2. Social support was a strong negative predictor of post-traumatic stress and depressive symptoms. Alcohol misuse was not significantly predicted by any of the variables. The present study highlights the role of perceived threat and trait neuroticism on postdeployment mental health symptoms and indicates social support is a robust protective factor. Efforts aimed at increasing sustained postdeployment social support may help defend against significant mental health problems among veterans.

## INTRODUCTION

Mounting research highlights the prevalence of post-traumatic stress disorder (PTSD), depression, alcohol misuse, and related problems among Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) veterans.[1–4] Nearly 1 in 5 OEF/OIF veterans report mental health concerns immediately following deployment,[2] and longitudinal research has demonstrated that the rate of mental health concerns continues to increase in the months following return from deployment.[3,4] These alarming statistics emphasize the significant impact of deployment on our service members and their families, and highlight related costs such as attrition from the military and increased health care needs for returning soldiers.[2] Consequently, there has been a significant interest in examining vulnerability and protective factors that are associated with mental health concerns among OEF/OIF veterans to more effectively stem the deleterious effects of combat on future military personnel.

Above all other factors contributing to veterans' mental health concerns, the impact of combat exposure on a variety of negative mental health outcomes has been well documented.[1,5,6] In fact, contemporary researchers have suggested that the focus on combat exposure has hindered understanding how other important personal and environmental factors affect mental health outcomes among veterans.[7] In recent years, a number of additional deployment-related factors as well as nonmilitary experiences and circumstances have been implicated in the development of veterans' mental health concerns. Regarding deployment-related factors, the subjective perception of threat (i.e., concern about safety and survival) has garnered significant attention with several studies demonstrating that perceived threat is more robustly associated with PTSD than actual combat experiences and that it accounts for the association between combat experiences and PTSD.[5,8,9] The extent to which perceived threat is associated with other mental health concerns has received relatively limited attention. Although there is some evidence that perceived threat is associated with depression,[10–12] the findings have

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been mixed,[13] suggesting the benefit of additional research in clarifying the association between perceived threat and other mental health problems.

Beyond deployment-related experiences, a growing body of research also highlights the impact of predeployment and postdeployment risk and resilience factors on mental health outcomes of veterans. For instance, prior history of stressful life events has been associated with poor outcomes.[14,15] In contrast, growing research has emphasized the protective nature of postdeployment social support in buffering against mental health problems.[5,7,12,16] In total, veterans' mental health outcomes are multiply determined by lifetime experiences both within and outside the military, highlighting the importance of evaluating diverse factors contributing to mental health outcomes in veterans. To that end, King et al have developed a suite of scales known as the Deployment Risk and Resilience Inventory (DRRI)[7] to capture experiences that are relevant to mental health and well-being of military personnel.

In addition to the experiences evaluated by the DRRI, variation in personality traits represents another factor that may confer risk for mental health concerns. In particular, neuroticism is a stable characteristic reflecting vulnerability to negative emotional experiences[17] that has been associated with mental health and substance use problems in veterans.[18–20] As noted by King et al[7] in the development of the DRRI, neuroticism may reflect an important variable that underlies associations between DRRI scales and mental health symptoms. To date, the extent to which neuroticism and DRRI scales are uniquely associated with mental health symptoms has not been evaluated.

This study examined the contribution of neuroticism, predeployment life events, deployment (combat experiences, perceived threat), and postdeployment social support on mental health symptoms at an initial assessment and two follow-up assessments completed 6 months and 1 year later (i.e., at 12 months and 24 months postdeployment). Specifically, the impact of these factors on symptoms of PTSD, depression, and substance use were evaluated. This is the first study to examine the association of neuroticism and DRRI scales on various mental health symptoms of OEF/OIF veterans at multiple time points. Consistent with prior research, it was expected that neuroticism, predeployment life events, and deployment experiences would each be associated with mental health problems at Time 1. Given the stability of personality traits, neuroticism, but not necessarily predeployment life events or deployment factors, was expected to predict mental health symptoms at subsequent assessments. Finally, social support was expected to protect against mental health symptoms at each assessment.

## METHODS

### Participants

The sample for this study included 271 OIF/OEF veterans who registered for Veterans Affairs (VA) health care subsequent to their return from deployment. Fewer than half had used any VA services at the time of recruitment into the study and, as requested by the local Institutional Review Board, veterans receiving VA mental health services at the study's inception were excluded from recruitment. Thus, this was a nonclinical sample. The initial evaluation (Time 1) took place approximately 6 months following their return, and participants were invited to complete additional evaluations at roughly 12 months (Time 2) and 24 months (Time 3) postdeployment. Over half of the original participants ($n = 141$) completed the Time 2 evaluation and one-third ($n = 97$) completed the Time 3 evaluation. In adherence to the Declaration of Helsinki, all participants provided written informed consent before participating. The study protocol was approved by the local Institutional Review Boards.

The veteran participants were largely males (85%) and ranged in age from 19 to 58 (Mean = 31.03, SD = 9.29). Twenty-eight percent of participants did not provide data on their race/ethnicity; the remainder was primarily Caucasian (68% of total). Forty-seven percent of participants described themselves as single/never married, 42% were married, and 8% were divorced. Almost all of the participants (93%) had a high school diploma or equivalent. Regarding the most recent deployment, 33% reported mainly combat duties, 46% reported mainly combat support, and 18% reported noncombat-related duty. The majority of participants (52%) were in the National Guard on the most recent deployment, 22% were reservists, and 21% were full-time active duty status. Eight-five percent served in the Army. The Navy, Air Force, and Marines each accounted for about 5% of participants.

### Measures

#### *Neuroticism*

Neuroticism was assessed using the Big Five Inventory (BFI),[21] a 44-item self-report measure of the Five-Factor Model personality traits. The BFI requires participants to rate themselves on a variety of characteristics using a 5-point Likert scale, ranging from "disagree strongly" (1) to "agree strongly" (5). Items on the neuroticism subscale assess characteristics such as emotional instability, anxiety, irritability, and sadness. Previous studies have documented high test–retest reliability, internal consistency, and convergent and divergent validity of the overall BFI and its subscales.[22] Internal consistency of the neuroticism subscale in our sample was good (Cronbach's $\alpha = 0.814$).

#### *Deployment Risk and Resilience Inventory*

The DRRI[7] consists of a series of self-report scales assessing predeployment, deployment, and postdeployment factors that have been linked to veteran physical and mental health outcomes. The present study utilized four of the scales. The Predeployment Life Events scale consists of 15 dichotomous (yes/no) items evaluating exposure to highly stressful or traumatic events (e.g., sexual abuse, domestic violence) occurring

before deployment. The Combat Experiences scale is a dichotomous (yes/no) scale that assesses exposure to a variety of combat experiences, such as firing a weapon at the enemy or participating in missions. The Deployment Concerns scale assesses perceived threat and concern about safety with items such as "I thought I would never survive" or "I was worried about getting an infectious disease," answered on a 5-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5). Using the same 5-point Likert scale, the Postdeployment Social Support scale evaluates the extent to which an individual feels understood and able to rely on others for emotional or other support when needed. The DRRI has shown good internal consistency, criterion-related validity, and discriminative validity with OIF veterans.[12] Internal consistency reliability in this study was as follows: Predeployment Life Events (Cronbach's $\alpha = 0.713$), Combat Experiences (Cronbach's $\alpha = 0.858$), Deployment Concerns (Cronbach's $\alpha = 0.900$), and Postdeployment Social Support (Cronbach's $\alpha = 0.890$)

*Post-Traumatic Stress Disorder*

Symptoms of PTSD were assessed with the PTSD Checklist-Civilian Version (PCL-C),[23] a 17-item self-report scale that assesses PTSD symptoms based on Diagnostic and Statistical Manual for Mental Disorders (Edition 4) criteria. Each item reflects one of the PTSD symptoms. Participants are asked to rate how much they have been bothered by each symptom in the past month using a 5-point Likert scale, ranging from "not at all" (1) to "extremely" (5). The total score, which ranges from 17 to 85, provides an index of current PTSD symptom severity. For military personnel, a total score of 50 or greater indicates likely PTSD.[24] In this study, 16% of the participants met or exceeded that threshold at Time 1, 12% at Time 2, and 10% at Time 3. At each time point, nearly twice as many veterans met or exceeded a more moderate cutoff of 40. Internal consistency, test–retest reliability, and convergent validity of the PCL-C have all been found to be adequate.[25,26] Internal consistency in our sample was excellent (Cronbach's $\alpha = 0.944$, 0.929, and 0.957 at Time 1, Time 2, and Time 3, respectively).

*Depression*

Symptoms of depression were evaluated with the Beck Depression Inventory-Short Form (BDI-SF),[27] a 13-item self-report questionnaire assessing the cognitive-affective aspects of depression. For each item, participants choose among four response options indicating increasing levels of symptom severity. Item scores range from 0 to 3 with a maximum total score of 39. The BDI-SF is derived from the BDI,[28] one of the most widely used rating scales for depression, and is often used in medical facilities. The BDI-SF has been found to have comparable internal consistency to that of the full BDI,[29] and Pearson product–moment correlation coefficients between the BDI-SF and full BDI support its use as a substitute for the longer version.[30] Internal consistency was good in the present sample (Cronbach's $\alpha = 0.89$, 0.909, and 0.914 at Time 1, Time 2, and Time 3, respectively). A score of 10 or greater is indicative of at least mild depressive symptoms.[31] In this study, 14% of participants at Time 1 and 21% of participants at Time 2 and Time 3 met or exceeded that threshold. Because of an administrative error, some participants at Time 1 did not complete the BDI-SF. Results for Time 1 depressive symptoms are based on 142 participants.

*Alcohol Misuse*

The Alcohol Use Disorders Identification Test (AUDIT)[32,33] is a widely used 10-item questionnaire assessing hazardous alcohol consumption. The items assess the following domains: amount and frequency of alcohol consumption, negative consequences of drinking, and symptoms of alcohol dependence. Possible scores range from 0 to 40, with scores of 8 or more indicating harmful alcohol use and possible dependence. Potentially problematic alcohol use was relatively common in the present sample, with 28% of participants at Time 1 and Time 2 and 20% of participants at Time 3 meeting or exceeding that threshold. Internal consistency of the items was good in the present sample (Cronbach's $\alpha = 0.814$, 0.858, and 0.881 at Time 1, Time 2, and Time 3, respectively).

### Analyses

Preliminary data analyses were conducted to examine for outliers and non-normality. Univariate outliers were brought to the fence by adjusting the extreme values to be equal to the median $\pm$ (2 $\times$ interquartile range). After adjusting for outliers, all of the variables were normally distributed. Bivariate correlations were calculated to determine the basic associations between variables. The primary analytic strategy involved a series of hierarchical multiple regressions to evaluate the ability of the DRRI scales and neuroticism to predict symptoms of PTSD, depression, and alcohol misuse at each of the three time points. For each of the regressions, variables were entered in blocks in the following order: neuroticism was entered in Block 1, predeployment life events were entered in Block 2 (i.e., predeployment), combat experiences and deployment concerns (i.e., perceived threat) were entered in Block 3 (deployment), and postdeployment social support was entered in Block 4 (postdeployment). To reduce the likelihood of Type I error, family wise level of significance was set to 0.01. Thus, with Bonferroni correction, independent variables in each of the regression models were considered significant if the $p$ value was less than 0.002 (0.01 divided by 5, the number of predictors in each analysis). All regressions were examined for normal distribution of residuals and multicollinearity, and no problems were detected.

## RESULTS

### Correlations

The correlations among the study variables are presented along with descriptive statistics in Table I. Neuroticism dem-

**TABLE I.** Descriptive Statistics and Correlations Among Study Variables

| | Variable | Mean | SD | Range | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Neuroticism | 19.58 | 5.56 | 9–39 | — | | | | | | | |
| 2 | Predeployment Life Events | 2.37 | 2.34 | 0–13 | 0.15* | — | | | | | | |
| 3 | Combat | 6.04 | 3.69 | 0–15 | 0.09 | 0.13* | — | | | | | |
| 4 | Perceived Threat | 42.61 | 11.53 | 15–74 | 0.28*** | 0.09 | 0.42*** | — | | | | |
| 5 | Postdeployment Support | 56.34 | 9.72 | 26–75 | −0.35*** | 0.01 | −0.08 | −0.14* | — | | | |
| | | | | | | Time 1 | | | | | | |
| 6 | PCL | 35.82 | 14.54 | 17–79 | 0.49*** | 0.20** | 0.44*** | 0.55*** | −0.34*** | — | | |
| 7 | BDI-13 | 5.47 | 5.32 | 0–22 | 0.54*** | 0.12 | 0.31*** | 0.44*** | −0.37*** | 0.75*** | — | |
| 8 | AUDIT | 6.06 | 4.87 | 0–27 | 0.16** | 0.10 | 0.16** | 0.10 | −0.07 | 0.16** | 0.12 | |
| | | | | | | Time 2 | | | | | | |
| 9 | PCL | 30.13 | 12.17 | 17–71 | 0.39*** | 0.27** | 0.26** | 0.41*** | −0.48***[a] | 0.77*** | | |
| 10 | BDI-13 | 5.08 | 5.55 | 0–28 | 0.43*** | 0.19* | 0.10 | 0.29*** | −0.50***[a] | 0.68*** | 0.70*** | |
| 11 | AUDIT | 5.9 | 5.13 | 0–26 | 0.05 | 0.09 | 0.22** | 0.17 | −0.24**[a] | 0.19* | 0.07 | 0.70*** |
| | | | | | | Time 3 | | | | | | |
| 12 | PCL | 31.25 | 13.4 | 17–73 | 0.49*** | 0.20** | 0.44*** | 0.55*** | −0.34***[a] | 0.78*** | | |
| 13 | BDI-13 | 5.22 | 5.76 | 0–28 | 0.54*** | 0.12 | 0.31*** | 0.44*** | −0.37***[a] | 0.70*** | 0.74*** | |
| 14 | AUDIT | 5.32 | 5.25 | 0–35 | 0.16** | 0.10 | 0.16** | 0.10 | −0.07[a] | 0.16 | 0.01 | 0.60** |

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. [a]Social support at Time 2.

onstrated weak to moderate correlations with the DRRI scales, indicating little overlap between the constructs. The DRRI scales and neuroticism were more highly correlated with symptoms of PTSD and depression than alcohol misuse. Symptoms of PTSD and depression were more highly correlated with each other than either was with alcohol misuse. Finally, scores on outcome variables were highly correlated across different assessments (e.g., PTSD Time 1 with PTSD Time 3).

### *Results of Hierarchical Regression Analyses*

The results for the full model of the hierarchical regression analyses predicting symptoms of PTSD, depression, and alcohol misuse at Time 1, Time 2, and Time 3 are presented in Table II. The primary findings are summarized here as follows. As expected, the findings indicate that neuroticism was the most consistent predictor of symptoms of PTSD and depression across all 3 assessment periods. Perceived threat was also a significant predictor of PTSD symptoms at Time 1 and Time 2, but not at Time 3. In terms of depressive symptoms, perceived threat was a significant predictor only at Time 2. With the exception of Time 1 depressive symptoms, social support provided a highly significant buffer against symptoms of PTSD and depression. Finally, none of the variables were significant predictors of alcohol misuse. Additional results for each set of regressions are presented separately below for PTSD, depression, and alcohol misuse.

**TABLE II.** Full Model Regression Analyses Predicting Primary Outcome Variables

| | Time 1 | | | Time 2 | | | Time 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| | B | SE | $\beta$ | B | SE | $\beta$ | B | SE | $\beta$ |
| PTSD | $R^2 = 0.51$, $p < 0.001$ | | | $R^2 = 0.47$, $p < 0.001$ | | | $R^2 = 0.43$, $p < 0.001$ | | |
| Predeployment LE | 0.58 | 0.3 | 0.09 | 1.09 | 0.41 | 0.17 | 0.53 | 0.50 | 0.08 |
| Neuroticism | 0.77 | 0.13 | 0.29* | 0.68 | 0.17 | 0.26* | 0.66 | 0.21 | 0.27* |
| Combat | 0.95 | 0.19 | 0.25* | 0.25 | 0.27 | 0.07 | 0.36 | 0.35 | 0.10 |
| Perceived Threat | 0.41 | 0.06 | 0.34* | 0.39 | 0.09 | 0.32* | 0.28 | 0.12 | 0.22 |
| Social Support | −0.26[a] | 0.07 | −0.18* | −0.53[b] | 0.09 | −0.39* | −0.057[b] | 0.12 | −0.42* |
| BDI | $R^2 = 0.42$, $p < 0.001$ | | | $R^2 = 0.47$, $p < 0.001$ | | | $R^2 = 0.38$, $p < 0.001$ | | |
| Predeployment LE | 0.16 | 0.15 | 0.07 | 0.34 | −0.16 | 0.13 | 0.09 | 0.22 | −0.04 |
| Neuroticism | 0.36 | 0.07 | 0.38* | 0.31 | 0.07 | 0.31* | 0.34 | 0.09 | 0.35* |
| Combat | 0.14 | 0.1 | 0.1 | −0.10 | 0.11 | −0.07 | 0.01 | 0.14 | 0.00 |
| Perceived Threat | 0.08 | 0.03 | 0.21 | 0.13 | 0.04 | 0.26* | 0.06 | 0.05 | 0.12 |
| Social Support | −0.09[a] | 0.04 | −0.18 | −0.24[b] | 0.04 | −0.45* | −0.20[b] | 0.05 | −0.38* |
| AUDIT | $R^2 = 0.04$, $p = 0.06$ | | | $R^2 = 0.09$, $p = 0.03$ | | | $R^2 = 0.11$, $p = 0.08$ | | |
| Predeployment LE | 0.12 | 0.13 | 0.05 | 0.05 | 0.18 | 0.02 | −0.02 | 0.17 | −0.01 |
| Neuroticism | 0.11 | 0.06 | 0.13 | −0.02 | 0.08 | −0.03 | 0.03 | 0.07 | 0.04 |
| Combat | 0.16 | 0.08 | 0.14 | 0.16 | 0.12 | 0.13 | 0.23 | 0.12 | 0.23 |
| Perceived Threat | −0.01 | 0.03 | −0.02 | 0.03 | 0.04 | 0.08 | −0.01 | 0.04 | −0.03 |
| Social Support | −0.01[a] | 0.03 | −0.01 | −0.10[b] | 0.04 | −0.22 | −0.07[b] | 0.04 | −0.19 |

*$p < 0.002$ (the value set byBonferroni correction). [a]Social support Time 1. [b]Social Support Time 2.

*Post-Traumatic Stress Disorder*

In the hierarchical regression model predicting PTSD symptoms at Time 1 and Time 2, $F$ change was significant at $p < 0.001$ for Blocks 1, 3, and 4, suggesting that neuroticism, deployment, and postdeployment factors all contributed significantly to PTSD symptoms. At Time 3, $F$ change was significant at $p < 0.001$ for Block 1 (neuroticism) and Block 4 (postdeployment social support) and at $p < 0.005$ for Block 2 (predeployment).

*Depression*

In the hierarchical regression model predicting depressive symptoms at Time 1, $F$ change was significant at $p < 0.001$ for Block 1 and Block 3 and at $p < 0.02$ for Block 4 suggesting that neuroticism, deployment, and postdeployment factor social support all contributed significantly to depressive symptoms. In the model predicting depressive symptoms at Time 2, $F$ change was significant at $p < 0.001$ for Block 1 (neuroticism) and Block 4 (postdeployment social support) and at $p = 0.006$ for Block 3 (deployment). Finally, in the model predicting depressive symptoms at Time 3, $F$ change was significant at $p < 0.001$ for Block 1 and Block 4 indicating that neuroticism and social support, but not predeployment or deployment experiences, were associated with depressive symptoms 24 months postdeployment.

*Alcohol Misuse*

In the hierarchical regression model predicting alcohol misuse at Time 1, $F$ change was significant only for Block 1 (neuroticism; $p = 0.027$). At Time 2, $F$ change was significant only for Block 4 (postdeployment social support; $p = 0.012$). At Time 3, $F$ change was marginally significant for Block 3 (deployment experiences; $p = 0.045$); no other blocks were significant predictors of alcohol misuse.

## DISCUSSION

The goal of this study was to examine the contribution of neuroticism and several DRRI scales to mental health concerns among a sample OEF/OIF veterans. Overall, the findings suggest that neuroticism and perceived threat during deployment are predictive of subsequent symptoms of PTSD and depression. In contrast, social support protects against symptoms of PTSD and depression. These results are consistent with independent lines of research highlighting the roles of personality traits and lifetime experiences in predicting veterans' mental health concerns and extends prior work by demonstrating the unique contributions of each.

A voluminous body of research has documented the association between neuroticism and psychopathology, particularly internalizing disorders such as PTSD and depression.[34–36] As expected and in line with prior research, neuroticism was a robust predictor of PTSD and depressive symptoms at each of the three time points in this study, even when all other DRRI predictors were included. Thus, results from this study indicate that trait neuroticism appears to be distinct from the DRRI scales and is an important factor that may significantly impact risk for postdeployment mental health concerns. Indeed, recent research has demonstrated that neuroticism interacts with other deployment-related variables to potentiate PTSD symptoms.[19] Neuroticism, however, is a broad trait comprised of a variety of characteristics (e.g., emotional instability, anxiety, depression). Further research aimed at parsing out the relationship between different facets of neuroticism and pathological outcomes in veterans may be useful in terms of more clearly identifying personality factors that may give rise to postdeployment mental health concerns among veterans. Notably, personality traits have also been shown to contribute to resilience; however, it was beyond the scope of this article to investigate resilience factors.

Here, as in previous studies,[5,8,10,11] combat experiences played a secondary role to perceived threat in terms of predicting PTSD symptoms. This finding is particularly compelling in light of the mounting research demonstrating that significant psychopathology is one of several possible outcomes following exposure to potentially trauma events.[37] In fact, resilience or healthy outcomes following exposure to potentially traumatic events appear to be the norm,[37,38] and the present findings suggest that threat appraisal may be a factor that distinguishes between healthy and pathological outcomes. Along those lines, a novel prospective study examining neural activity in soldiers before and after deployment to a combat zone found that DRRI-assessed perceived threat, but not combat experiences, was associated with sustained changes in connectivity between the amygdala and other brain regions.[39,40] These findings suggest that individual differences in threat appraisal are biologically mediated and may represent a vulnerability marker for subsequent PTSD. However, perceived threat appears to be less associated with depression and alcohol use problems. The limited research examining the association between perceived threat and depression has produced mixed results[10,11,13]; in the present study, perceived threat predicted depressive symptoms at Time 2 only. Although it is unclear why this relationship was significant only at Time 2, it is possible that individuals prone to depression may ruminate about their combat-theater experiences, thereby increasing the salience of threatening experiences over time. Finally, our findings that perceived threat is not associated with alcohol misuse are consistent with the only other study to examine perception of threat on substance use disorders.[11] Further research is warranted to determine the mechanisms through which threat perception differentially predicts mental health outcomes.

In this study, Predeployment Life Events were not predictive of any outcomes. This finding was somewhat surprising in light of previous research demonstrating that prewar events are associated with postdeployment onset of PTSD.[7,14] That being said, our null results are largely consistent with other research utilizing the Predeployment Life Events scale from the DRRI, which have also demonstrated no to little association between

prior stressors and mental health outcomes.[7,12] The Predeployment Life Events scale includes a variety of experiences, some of which assess potentially traumatic events (e.g., assault, abuse) whereas others assess more general life stress (e.g., job loss, parental substance use problems). Prior research demonstrating associations between prewar events and postdeployment PTSD have focused on traumatic experiences (e.g., abuse).[14] The inclusion of more general life stressors along with potentially traumatic events on the DRRI scale provides a more comprehensive assessment of prewar experiences but may also dilute scores and limit predictive utility regarding significant mental health outcomes.

In terms of symptoms of PTSD and depression, social support appears to be a powerful buffer that protects against postdeployment mental health concerns. Furthermore, the results of this study suggest that the influence of social support on moderating symptoms of PTSD and depression increases over time. In fact, at Time 2 and Time 3, social support is the strongest predictor of mental health outcomes with high social support exhibiting robust negative associations with PTSD and depressive symptoms. Clinically, the present findings suggest that postdeployment reintegration services that foster continued social support may be particularly beneficial in mitigating mental health problems among returning OEF/OIF veterans. Furthermore, efforts aimed at increasing social support may also reduce suicide risk among veterans. The interpersonal psychological theory of suicide[41] posits that a decreased sense of belonging is a key factor that promotes suicide risk. Thus, increasing opportunities for emotional and instrumental support may increase one's sense of belongingness, providing a buffer against suicide risk.

Notably, neither social support nor any of the other variables were significant predictors of alcohol misuse in the final model for this veteran sample. Although the absence of any significant predictors was somewhat surprising, it is consistent with results from the only other study to examine DRRI scales in relation to problematic substance use.[11] The rates of hazardous drinking in the present sample were consistent with those reported elsewhere[1,3] and may broadly reflect a feature of military culture rather than individual differences in deployment experiences or personality characteristics.[42] It is feasible that other personality characteristics not included in this study may have significantly predicted alcohol misuse. For instance, disinhibition is a trait characterized by impulsivity and risk-taking behaviors that has largely been associated with drug use[43,44]; however, recent studies have documented associations between disinhibition and alcohol use problems in military personnel.[20,45] Particularly given the preponderance of research highlighting morbidity and mortality associated with alcohol misuse, additional research examining factors that predict alcohol misuse in OEF/OIF veterans is warranted.

Overall, this study demonstrates that trait neuroticism and one's perception of threat during deployment are robust predictors of PTSD and depressive symptomatology in the initial years postdeployment; conversely, continued social support protects against those symptoms. Although the findings are novel and highlight important clinical considerations, the present results are not without limitations. First, the results are based entirely on self-report data. Although each of the measures is widely used, self-report assessments, particularly of psychopathology symptoms, fall short of gold-standard diagnostic interviews. Nonetheless, the rates of mental health problems exceeding established cutoffs are consistent with other large epidemiological studies. Second, because this was not a prospective study, veterans' characteristics and experiences were not evaluated before deployment. Consequently, in the case of neuroticism in particular, it is unclear to what extent the responses reflect stable features versus deployment-related negative effect. Although trait neuroticism is considered to be a relatively stable trait, there is some evidence that the relationship between neuroticism and psychopathology is bidirectional.[46] In other words, neuroticism may be a vulnerability factor for future psychopathology that may in turn serve to increase neuroticism. Finally, this is a nonclinical sample comprised primarily of Army and Army National Guard military personnel, and it is unclear whether or not the findings would generalize to other samples.

In conclusion, this study highlights the role of personality characteristics and one's perception of threat in predicting subsequent mental health concerns and indicates that social support is an immensely important protective factor. Efforts aimed at increasing opportunities for sustained postdeployment social support are likely to be beneficial in reducing the deleterious impact of combat-related experiences in our nation's military personnel.

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