Published in final edited form as:

Mil Behav Health. 2016 ; 4(3): 243–250. doi:10.1080/21635781.2016.1153533.

Deployment, Mental Health Problems, Suicidality, and Use of Mental Health Services Among Military Personnel

Carol Chu¹, Ian H. Stanley¹, Melanie A. Hom¹, Ingrid C. Lim², and Thomas E. Joiner¹

¹Florida State University, Department of Psychology, 1107 West Call Street, Tallahassee, FL 32306

²Office of the Surgeon General, Defense Health Headquarters, 7700 Arlington Blvd, Falls Church, VA 22042

Abstract

Following deployment, soldiers may struggle to cope with the after-effects of combat service and experience increased suicidality. Therefore, connection to mental health services is vital. Research regarding the relationship between deployment, suicidality, and mental health connections has been equivocal, with some studies finding a link between deployment history and mental health outcomes, and others not. The purpose of this study was to examine the effects of military deployment on mental health and service utilization outcomes using a longitudinal design. Deployment history, mental health visits, symptoms of suicidality, and various mental health outcomes were assessed in a sample of 1,566 Army recruiters at study entry and 18-months follow-up. Deployment history was positively associated with mental health visits, number of major depressive episodes, and acquired capability for suicide at baseline; however, no significant relationship between deployment, mental health visits, and any other suicide or mental health-related outcomes emerged at baseline or follow-up. Findings suggest a disconnection from mental health services among military personnel. Implications for treatment and suicide prevention efforts among military personnel are discussed.

Keywords

military; military deployment; mental health disorders; health service use; suicide; suicidal ideation; major depressive episodes; acquired capability for suicide

Historically, deployment into combat has been conceptualized as a toxic stressor for United States military personnel, conferring increased risk for a myriad of mental health problems, among them being suicidality (Kuehn, 2009; Prigerson, Maciejewski, & Rosenheck, 2002). Past research has demonstrated a link between combat deployment and numerous specific mental health problems, including depressive symptoms (Wells et al., 2010) and insomnia (Peterson, Goodie, Satterfield, & Brim, 2008). These conditions are notable risk factors for suicide (Van Orden et al., 2010). Given the high rates of suicide in the military as compared

to the general population (Bryan et al., 2014; Kuehn, 2009), delineating the link between deployment, mental health, suicidal symptoms, and service use is of utmost importance.

To this end, a recent systematic review and meta-analysis of the literature examining the link between combat deployment and suicidal thoughts and behaviors among military personnel and veterans found small, albeit nontrivial, effects of combat exposure and deployment (Bryan et al., 2015). However, findings across studies have been equivocal, with some studies unable to detect a discernable link between combat exposure and suicide-related outcomes. For example, a study of nearly four million U.S. military personnel across multiple branches who served during one or both of two recent wars (i.e., Operation Enduring Freedom or Operation Iraqi Freedom) did not find an association between deployment and suicide (Reger et al., 2015). Similar null results between deployment and suicide have been found in other studies (LeardMann et al., 2013), yet not all (Schoenbaum et al., 2014). Nonetheless, high rates of suicide exist in military populations (Bryan et al., 2014; Kuehn, 2009). As Bryan and colleagues (2015) note, methodological and subpopulation discrepancies likely account for these disparate findings, highlighting the need for additional research in this area utilizing diverse study designs and samples.

Given the high rates of suicide and adverse mental health outcomes among military personnel, it is also important to consider use of mental health services, particularly among those with a deployment history who may be experiencing readjustment issues upon return from deployment. On this front, data have largely been consistent: soldiers deployed into combat report low utilization of mental health care post deployment (Center for Military Health Policy Research, 2008; Hoge et al., 2004, 2014; Kuehn, 2009; Sharp et al., 2015). Salient reasons for low service use among this population include stigma (Gould et al., 2010), a preference for self-management of problems (Adler et al., 2015), and negative views of treatment (Vogt, 2011). In light of these barriers, it is also important to understand usage of mental health services among soldiers who have experienced one or more deployments. Noteworthy is that increasing engagement of soldiers into mental health treatment has been identified as a national priority (Brenner & Barnes, 2012).

One subpopulation of the U.S. military that has received relatively little scientific mental health attention is Army recruiters (Ribeiro et al., 2015). Recruiters are typically dispersed across the entire U.S., which is important to consider in light of a U.S. Army report demonstrating that geographical dispersion (i.e., more than approximately 50 miles from a military installation) is associated with an increased risk for suicide (United States Army, 2009). Many of these recruiters also have previous combat experience, and in this regard, may experience a variety of issues as they transition into their new roles. One reason for this increased risk among geographically dispersed persons might be the inherent relative lack of primary social support; indeed, the effects of deployment may be attenuated by feelings of belongingness or connectedness (Bryan & Heron, 2015).

Empirical inquiry into the effects of deployment on mental health and service utilization outcomes among U.S. Army recruiters is critical. Thus, utilizing a diverse sample of U.S. Army recruiters, this study aimed to examine the extent to which deployment history was associated with mental health outcomes and treatment utilization both at study enrollment

and 18-months follow-up. In terms of mental health variables, we assessed for several conditions that have both an empirical (e.g., depression, insomnia, hopelessness) and theoretical (i.e., thwarted belongingness, perceived burdensomeness, acquired capability) link to suicide-related behaviors (e.g., Bryan & Heron, 2015; LeardMann et al., 2013; Ribeiro et al., 2015). Suicide-related variables, including suicidal ideation and history of suicide attempts, were examined in relation to deployment history. Consistent with previous research, we hypothesized that deployment would have a small to null effect on mental health service use, mental health outcomes, and suicidality among Army recruiters. Further, it is important to note that, although a strength of this study is its longitudinal design, the purpose of this study was not to examine the pre-post effects of combat *per se*, but rather if deployment-related stressors prospectively persist post deployment.

Method

Participants

The study sample included a total of 1,566 Army recruiters and Army recruiter candidates. Participants included in analyses were primarily male (92.4%) and ranged in age from 21 to 49 years of age ($M = 29.88$, $SD = 4.96$). In this sample, 66.1% identified as White or Caucasian, 15.1% as Black or African American, 2.9% as Asian, 1.7% as Native Hawaiian or Other Pacific Islander, and 1.2% as American Indian or Alaska Native; 13.0% identified as Hispanic or Latino. With regards to education, 26.8% had completed high school, 51.8% some college, 10.1% an Associate degree, 9.6% a Bachelor's degree, 1.8% a Master's or professional degree, and 0.1% a professional degree. Ranks varied across participants and included sergeant (39.3%), staff sergeant (48.1%), sergeant first class (5.5%), master sergeant/first sergeant (2.1%), sergeant major/command sergeant major (0.3%), first lieutenant (promotable; 0.2%), and captain (4.5%).

Procedures

Participants were recruited from Army Recruiter courses provided at the United States Recruiting and Retention School located at Fort Jackson, South Carolina (e.g., Army Recruiters Course, Health Care Recruiters Course, Company Commanders' Course). Individuals were given the option of participating in the present study during orientation for their course. Those who elected to enroll in the study completed a series of self-report measures as a part of a larger battery of orientation assessments. Demographics (i.e., age, gender, race, education), military history (i.e., military rank, number of previous deployments), and medical history information (i.e., number and type of mental health visits) were all obtained from participants' military medical records. Number of suicide attempts, non-suicidal self-injury episodes, and DSM-IV-TR-defined major depressive episodes were each assessed by a military psychiatrist and were also extracted from participants' medical records. These army record data were collected both for the time frame prior to study enrollment and 18 months after completion of the self-report surveys. All participants provided informed consent after being provided with a full explanation of study procedures, and both the Medical Research and Materiel Command Institutional Review Board (IRB) and university IRB approved all study procedures.

Measures

The following data were obtained either from electronic records or from a basic computerized assessment: demographics (i.e., age, gender, ethnicity/race, marital status); suicide risk factors (e.g., lifetime history of suicide attempts, episodes of self-injury, history of non-suicidal self-injury); and current mental health diagnoses (e.g., major depressive episodes).

Acquired Capability for Suicide Scale (ACSS; Ribeiro et al., 2014)—An abbreviated 4-item version of the 7-item ACSS was used to assess physical pain tolerance and perceived fearlessness about death. Individuals rate each item (e.g., “I am not afraid to die”) on a 5-point Likert scale (total scores range from 0 to 16). Higher scores indicate greater pain tolerance and fearlessness about death. Past studies provide support for the ACSS as a measure with good convergent, discriminant, and construct validity (Ribeiro et al., 2014), and the version used within the present study was found to have adequate internal consistency ($\alpha = .76$). Given previous research detecting a link between combat exposure and acquired capability (Bryan, Cukrowicz, West, & Morrow, 2010), the ACSS was included as a mental health outcome variable.

Depression Symptom Inventory-Suicidality Subscale (DSI-SS; Metalsky & Joiner, 1997)—The DSI-SS is a 4-item, self-report measure that assesses suicidal thoughts, perceived control over suicidal thoughts, suicide attempt plans, and suicidal impulses. Each item is rated on a 4-point Likert scale (total scores range from 0 to 12). Higher DSI-SS scores indicate greater severity of suicidal symptoms. The DSI-SS has been shown to have good psychometric properties, including strong construct validity and internal consistency (Joiner, Pfaff, & Acres, 2002), and it demonstrated adequate internal consistency within the present study ($\alpha = .74$). The DSI-SS was included as an outcome variable since previous research has found a link between combat exposure and suicidality (Bryan, Hernandez, Allison, & Clemans, 2013).

Interpersonal Needs Questionnaire (INQ; Ribeiro et al., 2014; Van Orden, Cukrowicz, Witte, & Joiner, 2012)—The INQ assesses two constructs: thwarted belongingness (i.e., perceived lack of meaningful connections) and perceived burdensomeness (i.e., belief that one’s death is worth more than one’s life). For this study, 7 items were drawn from the full INQ-25 and abbreviated INQ-15, and an additional item was included to assess for perceived burdensomeness within a military population (“These days I think I am an asset to the people in my life”). Each subscale consisted of four items, with each item rated on a 7-point scale. Past research on the INQ-15 has found good internal consistency for the thwarted belongingness ($\alpha = .85$) and perceived burdensomeness ($\alpha = .89$; Van Orden et al., 2012) scales, which was also demonstrated in the present sample ($\alpha = .91$ and $\alpha = .89$, respectively). The INQ was included as an outcome variable since previous research has demonstrated a link between combat exposure and thwarted belongingness and perceived burdensomeness (Bryan, Hernandez, Allison, & Clemans, 2013).

Insomnia Severity Index (ISI; Bastien, Vallières, Morin, Vallières, & Morin, 2001)—An adapted, 5-item version of the original 7-item ISI was used to assess severity of

insomnia symptoms. Individuals rate various sleep problems (e.g., difficulties falling asleep) on a 5-point Likert scale (total scores range from 0 to 20). Higher scores signal more severe insomnia symptoms. The ISI has been demonstrated to have good construct validity and internal consistency (Bastien et al., 2001; Morin et al., 2011), and in this study, the 5-item abbreviated version of the ISI was also found to have good internal consistency ($\alpha = .88$). The ISI was included as an outcome variable as previous research has found a link between combat exposure and sleep problems (Peterson, Goodie, Satterfield, & Brim, 2008).

Suicide Cognition Scale (SCS; Bryan et al., 2014)—An abbreviated 10-item version of the original 25-item SCS was utilized to measure the extent to which individuals were experiencing suicide-specific hopelessness. Individuals rate a series of statements (e.g., “Suicide is the only way to end this pain”) on a 1 to 5 scale (total scores range from 10 to 50). Higher scores suggest greater suicide-specific hopelessness. The SCS has been shown to be a valid and reliable measure of suicide-specific cognitions within a military sample (Bryan et al., 2014). The abbreviated version of the SCS used within this study was also found to have good internal consistency ($\alpha = .88$). The SCS was included as an outcome variable since previous research has revealed a link between combat exposure and suicidal cognitions (Bryan et al., 2014).

Data Analysis

Multiple regression analyses were used to examine the relationship between the number of previous deployments and the number of mental health visits at baseline and 18-months follow up. Of note, mandatory mental health visits (i.e., standard pre- and post-deployment mental health assessments) were excluded from analyses in order to more accurately capture the extent to which deployment history was associated with voluntary mental health visits. Multiple regression analyses were also employed to examine the main effects of number of previous deployments on the following baseline mental health outcome variables: (1) number of major depressive episodes; (2) number of suicide attempts; (3) suicidal ideation; (4) suicide-specific cognitions; (5) presence of non-suicidal self-injury; (6) number of episodes of self-injury; (7) insomnia severity; (8) perceived burdensomeness; (9) acquired capability for suicide; and (10) thwarted belongingness. Multiple regression analyses were also employed to examine the extent to which deployment history predicted number of major depressive episodes over the 18-month study period at follow-up. Unfortunately, we were underpowered to detect the extent to which deployment history predicted suicide attempts and non-suicidal self-injury at follow-up because of very few occurrences ($< 1\%$); thus, these outcome variables were not included in the analyses. In all analyses, the following variables were entered as covariates: age at study enrollment, gender, military rank at study enrollment, race, and highest education level attained.

Results

Missing data, which were minimal ($< 1\%$), were handled using pairwise deletion. Tolerance and variance inflation factor values were examined for all regression analyses and determined to be in the acceptable range ($> .10$, < 5 , respectively). Suppression was also examined for all regression equations; beta values were within acceptable range (Beta $<$

zero-order correlation). One variable, perceived burdensomeness, evidenced significant positive skew ($S=2.12$). To address the skew, a square root transformation was used; this decreased the skew from 2.12 to 1.56. Univariate outliers (median $\pm$ 2 interquartile ranges) were identified for thwarted belongingness and depressive symptoms. Outliers were addressed by bringing the score in question to the next highest value within two interquartile ranges. No bivariate outliers were identified.¹ Means, standard deviations, and correlations between study variables are presented in Table 1. All regression analyses are summarized in Table 2.

Deployment and Mental Health Visits – Baseline and Follow-up

Regression analyses were conducted with number of deployments predicting the number of mental health visits at baseline. Results indicated that total number of deployments was significantly related to number of mental health visits at baseline, after controlling for covariates ($\beta = .057, p = .025$, squared partial correlation (pr^2) = .003).

Regression analyses were conducted to determine the degree to which number of deployments predicted the number of mental health visits at 18-month follow-up. Results indicated that total number of deployments was not significantly related to number of mental health visits at follow-up, after controlling for covariates ($\beta = -.026, p = .470$).

Deployment and Mental Health Outcomes - Baseline and Follow-up

Regression analyses were conducted to assess the extent to which number of deployments predicted mental health outcomes at baseline. Results indicated that total number of deployments was only significantly related to the number of major depressive episodes ($\beta = .056, p = .028, pr^2 = .003$) and acquired capability for suicide ($\beta = .145, p = .017, pr^2 = .004$), after controlling for covariates (i.e., other mental health outcomes and demographic variables). A marginally significant relationship also emerged between total number of deployments and number of previous suicide attempts ($\beta = .044, p = .086, pr^2 = .002$), after controlling for covariates. Conversely, total number of deployments was not significantly related to suicidal ideation ($\beta = -.024, p = .346$), insomnia severity ($\beta = .028, p = .267$), suicide cognitions ($\beta = -.04, p = .118$), non-suicidal self-injury ($\beta = .007, p = .789$), number of episodes of self-injury ($\beta = .033, p = .202$), perceived burdensomeness ($\beta = -.013, p = .602$), or thwarted belongingness ($\beta = .010, p = .690$), controlling for mental health outcome and demographic covariates.

Regression analyses were conducted with number of deployments predicting the number of major depressive episodes that occurred over the course of the study. Results indicated that total number of deployments was not significantly related to the number of major depressive episodes ($\beta = -.033, p = .361$), after controlling for covariates.

Discussion

Given the high rates of suicide and mental health-related symptoms among military personnel, it is vital to understand the factors that contribute to these symptoms and whether

¹Of note, analyses were also conducted with the outliers included and the pattern of findings remained consistent.

military service members are receiving adequate mental health resources. The present results indicated that military deployment history was significantly positively related to the number of mental health visits, number of major depressive episodes, and acquired capability at baseline. Notably, these findings remained significant even after accounting for the effects of various covariates. However, no significant relationship emerged between military deployment history, number of mental health visits at follow-up, and any other suicide and mental health-related outcomes at baseline and follow-up.

Consistent with previous research (Hoge, Auchterlonie, & Milliken, 2006), the present findings suggest that the number of previous military deployments is associated with a greater number of post-deployment mental health visits at study baseline. This suggests that issues of stigma (Gould et al., 2010) and negative views towards treatment (Vogt, 2011) may be less salient in Army recruiters. However, this effect was non-significant at follow-up. On the one hand, this might suggest that the issues for which soldiers initially sought care resolved with mental health treatment. On the other hand, this might alarmingly signal elevations in attrition or disconnection from mental health services among military personnel. This is an empirical question that cannot be ascertained from the current study, in part because self-report measures administered at baseline were not re-administered at follow-up. Therefore, it is unclear if individuals who continued to attend mental health visits had more severe symptoms, if their problems were not being adequately addressed through mental health treatment, or if they chose to remain in treatment to maintain treatment gains. Additional prospective evaluation of the mechanisms underlying the relationship between mental health visits and help-seeking behaviors would be informative. Nonetheless, these findings underscore the potency of deployment history as a mental health-specific risk factor and emphasize the critical need to provide resources to this population during reintegration to civilian life.

As expected, the current findings are also consistent with findings from a recent meta-analysis (Bryan et al., 2015), which found a null or very small effect of military deployment history on suicide-related outcomes, including suicidal ideation and attempts. Only two variables evinced significant relationships with deployment history: major depressive episodes and acquired capability for suicide. Both of these variables have previously shown robust positive associations with military experience (Bryan, Cukrowicz, West, & Morrow, 2010; Gadermann et al., 2012) and are also significant predictors of suicide risk (Smith, Cukrowicz, Poindexter, Hobson, & Cohen, 2010). Consistent with previous research, higher levels of acquired capability and a greater number of major depression episodes post deployment in this study may be due to increased exposure to violence, injury to self and others, and disconnection from primary social support during combat and deployment (Bryan, Cukrowicz, West, & Morrow, 2010; Wells et al., 2010). Therefore, our findings provide additional support for the role of these variables in conferring suicide risk among military service members.

Furthermore, given the non-significant relationships between deployment and suicide ideation and attempts, the present study's findings also suggest that deployment may indirectly contribute to suicide risk via depressive symptoms and elevated levels of acquired capability. Alternatively, Army recruiters are extensively screened and considered to be

higher functioning than other military populations, which may have contributed to the attenuated effects of deployment on suicide and mental health outcomes. Given that rates of suicide attempts and non-suicidal self-injury across the 18-month study period were low, our ability to assess predictions of suicidal behaviors and non-suicidal self-injury is limited. Consequently, further research is warranted to investigate the potential relationship between deployment history and suicide across extended study periods and multiple military samples.

Results should be considered in the context of other study limitations. First, details about participants' experiences prior to enlisting in the military and with past deployments while serving in the military (e.g., duration, nature, and timing of past deployments) were not captured in the present study. It is possible that such factors might also influence whether individuals experience the onset of certain mental health problems and whether they elect to seek out mental health services. Additional work is warranted to more precisely pinpoint how deployment may impact suicide and mental health-related outcomes over time. Finally, given that medical records were used to obtain information psychiatric history and this information was not systematically assessed at 18-months follow-up, it is possible that there was an underestimation of the number of major depressive episodes, suicide attempts, and non-suicidal self-injury during the study period. This may partially explain the lack of a significant finding when examining the relationship between deployment and major depressive episodes over 18 months. Future studies might benefit from a more routine and standardized assessment of psychiatric outcomes over the course of the study.

Nonetheless, to our knowledge, this is the first study to examine the link between deployment, suicidality, mental health outcomes and service use in Army recruiters. A key finding from this study is the higher rates of mental health services use documented among veterans with a greater number of previous deployments. These results, while encouraging, reveal the challenges in ensuring that mental health services are sufficiently staffed and adequately trained to meet the needs of soldiers—many who may be of high suicide risk—returning from deployment. Rates of suicide are strikingly high in military populations (Bryan et al., 2014; Kuehn, 2009). Ultimately, it is our hope that future research will continue to elucidate the link between deployment and mental health and suicide-related outcomes and by so doing, ensure that upon return from deployment, soldiers in need of care are able to readily receive adequate and appropriate mental health services.

Acknowledgments

This work was in part supported by the Military Suicide Research Consortium (MSRC), an effort supported by the Office of the Assistant Secretary of Defense for Health Affairs under Award No. (W81XWH-10-2-0181). Opinions, interpretations, conclusions and recommendations are those of the author and are not necessarily endorsed by the MSRC or the Department of Defense.

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Table 1

Means, Standard Deviations, and Correlations between Study Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Deployment History	-													
<i>Baseline</i>														
2. Mental Health Visits	.06*	-												
3. Major Depressive Episodes	.05*	.39**	-											
4. Suicide Attempts	.04	.14**	.11**	-										
5. Suicidal Ideation	-.02	.03*	.05*	.01	-									
6. Suicide Cognitions	-.03	.02	.06**	-.01	.51**	-								
7. Non-suicidal Self-injury	.01	.08**	.08**	.08**	.03	.02	-							
8. Episodes of Self-injury	.03	.26**	.31**	.31**	.05*	.01	.13**	-						
9. Insomnia Severity	.03	.11**	.11**	-.01	.11**	.22**	-.01	.05*	-					
10. Perceived Burdensomeness	-.01	.04*	.06**	.91	.32**	.54**	.02	.01	.22**	-				
11. Acquired Capability	.07*	-.01	-.01	.05*	.03	-.01	.02	.01	.10**	-.02	-			
12. Thwarted Belongingness	.01	.05*	.08**	-.01	.21**	.32**	.01	.03	.27**	.35**	-.04*	-		
<i>Follow-Up</i>														
12. Mental Health Visits	-.02	.11**	.07**	.03	.04*	.04*	-.00	.04*	.11**	.06*	.03	.06*	-	
13. MDE	-.03	.11**	.12**	.02	.04*	.06*	.07**	.05*	.08**	.06*	-.01	.06*	.39**	
<i>Mean</i>	2.09	5.40	.17	.01	.03	10.3	.01	.02	4.43	4.43	9.53	7.21	2.16	.03
<i>SD</i>	1.35	11.35	.57	.09	.25	1.63	.04	.18	3.73	1.70	3.25	4.58	10.19	.25

Note.

* $p < .05$;

** $p < .001$.

Non-suicidal Self-Injury (coded 0 = absent, 1 = present). N ranged from 1,558 to 1,566 due to missing values. SD = Standard Deviation.

Table 2
Summary of Multiple Regression Analyses with Military Deployment as the Predictor

Outcome Variables	R ²	F	b	SE	β	p	pr ²
<i>Baseline</i>							
Mental Health Visits	.009	2.450 *	.591	.264	.057	.025	.003
<i>Mental Health Outcomes</i>							
Major Depressive Episodes	.017	4.422 **	.020	.009	.056	.028	.003
Suicide Attempts	.004	1.094	.004	.002	.044	.086	.002
Suicidal Ideation	.005	1.277	-.004	.005	-.024	.346	-
Suicide Cognitions	.004	1.079	-.053	.034	-.04	.118	-
Non-suicidal Self-injury	.001	.319	.00	.001	.007	.789	-
Self-injury Episodes	.006	1.518	.005	.004	.033	.202	-
Insomnia Severity	.009	2.443 *	.081	.072	.028	.267	-
Perceived Burdensomeness	.005	1.356	-.017	.033	-.013	.602	-
Acquired Capability		.145	.060	.060	.060	.017	.004
Thwarted Belongingness	.004	.920	.035	.088	.010	.690	-
<i>Follow-Up</i>							
Mental Health Visits	.013	1.673	-.163	.225	-.026	.470	-
<i>Mental Health Outcomes</i>							
Major Depressive Episodes	.003	.374	-.005	.005	-.033	.361	-

Note.

* $p < .05$;

** $p < .001$.

Non-suicidal Self-Injury (coded 0 = absent, 1 = present).

Regression analyses were conducted with military deployment entered as the predictor of mental health visits and various mental health outcomes at baseline and 18-month follow-up. The following covariates were entered: age, gender, military rank, race, and highest education.