Published in final edited form as:

J Am Coll Health. 2015 October ; 63(7): 418–426. doi:10.1080/07448481.2014.931282.

Mental Health and Self-directed Violence Among Student Service Members/Veterans in Postsecondary Education

John R. Blosnich, PhD, MPH^{1,2}, Marek S. Kopacz, MD, PhD³, Janet McCarten, PhD³, and Robert M. Bossarte, PhD^{1,3}

¹University of Rochester, Department of Psychiatry

²Center for Health Equity Research and Promotion, VA Pittsburgh Healthcare System

³U.S. Department of Veterans Affairs, VISN-2 Center of Excellence for Suicide Prevention

Abstract

Objectives—Using a sample of student service members/veterans, the current study aimed to examine the prevalence of psychiatric diagnoses and suicide-related outcomes and the association of hazardous duty with mental health.

Participants—Data are from the Fall 2011 National College Health Assessment (n=27,774).

Methods—Logistic regression was used to examine (1) the association of student service member/veteran status with mental health outcomes and (2) the association of hazardous duty with mental health outcomes among student service members/veterans (n=706).

Results—Student service members/veterans had higher odds of self-harm than students without military experience. Among student service members/veterans, hazardous duty was positively associated (OR=2.00, 95% CI: 1.30–3.07) with having a psychiatric diagnosis but negatively associated (OR=0.41, 95% CI: 0.20–0.85) with suicidal ideation.

Conclusions—Self-harm may be a unique phenomenon among service members/veterans. Suicide prevention with this population should include information about self-harm, and future research should explore whether suicidal intent underlies self-harm.

Keywords

veterans health; mental health; suicidal ideation; attempted suicide; self injurious behavior

INTRODUCTION

Over 500,000 U.S. military veterans returning from post-9/11 service have utilized educational benefits through the Department of Veterans Affairs (VA).¹ Recent evidence suggests that college-attending veterans experience high prevalence of symptoms of psychological problems, including depression, anxiety, and posttraumatic stress disorder (PTSD).² Furthermore, veterans and service members have garnered particular attention as a possible population with mental health disparities, especially regarding suicide risk.^{3–6}

Although the precise etiology of suicidal risk disparities among military experienced remains unknown, several factors that have been identified, such as relationship dissolution⁷ and posttraumatic stress disorder⁸ as well as hazardous duty-related consequences, such as traumatic brain injury⁹ and combat exposure.^{10–12} In spite of an increase in research about mental health and suicide risk among service members and veterans, little is known about the demographic and mental health characteristics of service members/veterans who are also currently enrolled as students in postsecondary education.

Mental health and self-directed violence among college students

Mental health concerns and self-directed violence are prevalent among young adults, including college-attending populations.^{13–17} For instance, in an examination of data from the National Epidemiologic Study of Alcohol and Related Conditions, Blanco and colleagues noted that overall, college-attending respondents had similar prevalence of past 12-month psychiatric diagnoses when compared with their contemporaries who were not attending college. Additionally, Zivin et al. found approximately 6.4% of a sample of college students reported past-year suicidal ideation,¹⁴ compared with a general U.S. adult population prevalence of 3.7%.¹⁸ Research also has shown higher prevalence of self-reported suicide attempts. Data from over 80,000 students who participated in the Spring 2008 American College Health Association (ACHA) survey showed that 1.3% reported a suicide attempt in the past school year.¹⁹ The general U.S. adult population prevalence of past 12-months suicide attempt was approximately 0.5%.¹⁸ Moreover, very high prevalence of deliberate self-harm has been noted in young adult and college populations.^{17,20,21}

Mental health and self-directed violence among student service members/veterans

Despite a large body of research about mental health and self-directed among college populations, very little is known about the subset of college populations who are service members/veterans. Barry et al. (2012) noted that binge drinking was positively associated with depression, anxiety, and posttraumatic stress among student service members/veterans but there was no association between binge drinking and these mental health problems among students without military service.²² In a different analysis, Barry and colleagues found that student service members/veterans who experienced trauma related to combat were more likely to report posttraumatic stress than either their civilian peers or their military-experienced peers without exposure to combat.²³ In one of the only studies that currently focuses on student veterans and suicidal thoughts and behaviors, Rudd, Goulding, and Bryan (2011) noted elevated prevalence of symptoms of depression and anxiety in a national sample of student veterans.² In particular, the authors noted that the prevalence of suicidal thoughts and behaviors was higher in their sample of student veterans than estimates from a large national sample of college students. However, the sample of student veterans in the Rudd et al. study was a convenience-based sample without a direct student non-veteran comparison group. Further study is needed to examine these findings within more robust sampling methodology.

Student service members/veterans as an at-risk population

Several subpopulations of veterans have been identified with elevated risk for suicide-related outcomes when compared with their non-military experienced peers, such as women

veterans,²⁴ veterans utilizing Veterans Health Administration (VHA) services,⁴ and sexual minority veterans.²⁵ It is unclear whether student service members/veterans may also comprise a subpopulation of veterans with high prevalence of suicidal thoughts and behaviors. Student service members/veterans may have experiences that are associated with elevated prevalence of mental health problems (e.g., PTSD, suicidal ideation) that could result from consequences of hazardous duty, including traumatic brain injury and combat exposure.^{11,26} For example, Bryan and colleagues noted a stronger link between feelings of guilt and suicidal ideation among veterans who experienced combat.¹⁰ Similarly, Maguen et al. found an association between killing in combat and suicidal ideation among a representative sample of Vietnam veterans; an association that persisted even after adjusting for known correlates of suicidal ideation (e.g., PTSD, depression, substance use).¹¹

While there is a flurry of research about suicidal ideation, suicide attempt, and suicide mortality among service members/veterans, there are very few studies that have examined the prevalence of deliberate self-harm behaviors among military/veteran populations in general. While deliberate self-harm is associated with suicide,^{27,28} it is conceptualized as a distinct phenomenon in that a person harms him/herself without the intent to die.²⁹ For instance, in an analysis of deliberate self-harm among VHA veterans, Kleespies et al. noted that one-quarter of patients with self-harm reported no intent to die. Among a clinical sample of over 500 veteran men who met criteria for PTSD, Sacks and colleagues found over half of the respondents indicated self-mutilating behavior in the last two weeks, and those who reported self-harm had significantly worse mental health profiles, including depression and more severe PTSD.³⁰ It is unclear whether there are differences among deliberate self-harm among nonclinical samples of service members/veterans compared with those without military service experience. Since self-harm behaviors are prevalent among young adults,^{17,20,21} college attending samples may constitute a particularly useful population in which to investigate differences in self-harm behaviors by military experience.

The present study builds on previous research about mental health outcomes among student service members/veterans by examining prevalence of psychiatric diagnoses, past 12-months self-harm, and past 12-months suicidal ideation and suicide attempt among a large national sample of students with and without a history of military service. Moreover, the study seeks to explore if student service members/veterans with and without self-reported hazardous duty experience differ in mental health and suicide risk. Based on previous studies, the following hypotheses were proposed: (1) student service members/veterans will have significantly higher prevalence and odds of past 12-months psychiatric diagnoses, self-harm, suicidal ideation or attempt than their non-military experienced peers; and (2) among student service members/veterans, those with self-reported hazardous duty experience will report significantly higher prevalence and odds of past 12-months psychiatric diagnoses, self-harm, and suicidal ideation or attempt than their peers who do not self-report experiencing hazardous duty.

METHODS

Sample

Data are from the Fall 2011 National College Health Assessment (NCHA), which is created and managed by the American College Health Association (ACHA). Postsecondary educational institutions purchase the survey to administer to enrolled students, and data from institutions that use a census or random sampling design of their students are concatenated by ACHA to create national datasets by semester.³¹ The Fall 2011 NCHA dataset includes 27,774 respondents from 44 participating institutions. Most institutions (95.4%) used web-based survey administration, and the mean response rate among the participating schools was 24%.³² Further details of the sample are available from the American College Health Association.³²

Student service member/veteran status

In Fall 2011, ACHA introduced a new question to the NCHA-II survey that assessed history of military service [i.e., “Are you currently or have been a member of the United States Armed Services (Active Duty, Reserve, or National Guard)?”] Response options were no; yes and I have deployed to an area of hazardous duty; yes and I have not deployed to an area of hazardous duty. Student service member/veteran status was defined as those who reported yes (regardless of hazardous duty experience). Additionally, the student service members/veterans were divided into two groups based on their affirmative response to the aforementioned military service question: student service members/veterans with and without hazardous duty exposure.

Demographic information

Standard demographic variables included: age (in years), sex (male vs. female), and enrollment status (full-time vs. part-time). Race/ethnicity was coded as white, non-Hispanic; African American/black, non-Hispanic; Asian, non-Hispanic; multiple racial groups, non-Hispanic; other racial groups, non-Hispanic; and Hispanic. Additionally, since sexual orientation has been associated with elevated prevalence of psychiatric conditions, suicidal ideation, and suicide attempt,³³ we also examined self-report sexual identity. Specifically, respondents were asked “What is your sexual orientation?” Response options were heterosexual, gay/lesbian, bisexual, unsure. Due to the low prevalence of veterans who identified as sexual minority, sexual orientation was dichotomized into heterosexual vs. gay/lesbian, bisexual, and unsure.

Covariates of suicide risk

Prior research indicates that stress, alcohol use, and mental health service utilization are associated with suicidal risk,^{34–36} so we adjusted our analyses using variables within the NCHA survey that represent these factors. Past 12-month stress level (i.e., “Within the last 12 months, how would you rate the overall level of stress you have experienced? no stress; less than average stress; average stress; more than average stress; tremendous stress”) was coded 0 through 4, with higher values indicating higher stress levels. Alcohol use was defined by use in the past 30-days (i.e., “Within the last 30 days, on how many days did you

use alcohol (beer, wine, liquor)? never used; have used, but not in the last 30 days; 1–2 days; 3–5 days; 6–9 days; 10–19 days; 20–29 days; used daily”). Those who indicated “never used” were recoded into the “no use in the last 30 days” category, resulting in a 7-item response category in which higher numbers indicated higher levels of alcohol use. Finally, mental health service utilization was defined by respondents’ indication of whether they had ever sought mental health services from four different types of providers: counselor, therapist, psychologist; psychiatrist; other medical provider (e.g., physician, nurse practitioner); or minister, priest, rabbi, other clergy.

Mental health outcomes

Three items were used to assess self-directed violence. Respondents were asked three separate questions of have you ever 1) “intentionally cut, burned, bruised, or otherwise injured yourself,” 2) “seriously considered suicide,” or 3) “attempted suicide.” Response options included no, never; no, not in the last 12 months; yes in the last 2 weeks; yes in the last 30 days; yes in the last 12 months. For each of the three items, the response options were dichotomized into past 12-months (yes in the last 2 weeks; yes in the last 30 days; yes in the last 12 months) vs. not in the past 12-months (no, never; no, not in the last 12 months).

The outcome of psychiatric diagnosis was created from an item that asked respondents if they had been diagnosed or treated by a professional in the last 12 months for any of 15 listed conditions: anorexia, anxiety, attention deficit/hyperactivity disorder, bipolar disorder, bulimia, depression, insomnia, other sleep disorder, obsessive compulsive disorder, panic attacks, phobia, schizophrenia, substance abuse or addiction (alcohol or other drugs), other addiction (e.g., gambling, internet, sexual), and other mental health condition. Response options included no; yes, diagnosed but not treated; yes, treated with medication; yes treated with psychotherapy; yes treated with medication and psychotherapy; yes other treatment. A dichotomous variable of past 12-months psychiatric diagnosis was created, based on respondents who indicated a diagnosis or treatment for one or more of any of the listed conditions versus respondents who indicated no diagnoses/treatment.

Analyses

Chi-square tests of independence were used to examine differences in categorical demographic characteristics, mental health outcomes, and service utilization variables between (1) student service members/veterans vs. students without military experience and (2) between student service members/veterans with hazardous duty experience vs. student service members/veterans without hazardous duty experience. Differences in age were assessed with t-tests, and Mann-Whitney tests were used to examine differences in stress and alcohol use.

Using the entire sample, four multiple logistic regression models were used to examine the association of student member/veteran status with mental health outcomes of psychiatric diagnosis, self-harm, suicidal ideation, and suicide attempt. Specifically, these models assessed the association of student service member/veteran status with each of the four

mental health outcomes while adjusting for demographic information and covariates related to suicide risk.

Using only the student service members/veterans within the sample, a second set of multiple logistic regression models was used to examine the association of exposure to hazardous duty with each of the mental health outcomes. Because of the rarity of suicide attempt among the student service member/veteran group, the model examining suicide attempt created estimates that were unstable [data not shown]. Consequently, the second set of models only included psychiatric diagnosis, self-harm, and suicidal ideation.

For all multivariable models, race/ethnicity was recoded into a two-category variable of white and racial/ethnic minority due to small samples of specific racial/ethnic minority student service members/veterans. Furthermore, to create a more parsimonious model and preserve degrees of freedom to accommodate the small sample of student service members/veterans, the four individual variables of ever seeking mental health care from different types of providers were recoded into a single dichotomous variable of ever received care from any of these sources versus never received care from any of these sources. Variance inflation factors were used to assess for collinearity in multivariable models and showed no problematic correlations among any of the included variables. All analyses were conducted using Stata/SE Ver. 12. This study was approved by the [university name masked for peer review] Institutional Review Board.

RESULTS

Overall, 2.6% of the sample (n=706) self-identified as a service member/veteran. When compared with students without military service, student service members/veterans were significantly older, had a higher proportion of males, were less racially/ethnically diverse, and were more likely to attend school part-time (see Table 1). Student service members/veterans and students without military service did not differ in terms of sexual orientation. Among student service members/veterans, those with hazardous duty experience were older, had a higher proportion of males, and were less racially/ethnically diverse than student service members/veterans without hazardous duty experience.

Student service members/veterans and students without military service did not differ in crude prevalence of stress or prevalence of alcohol use (see Table 2). A significantly larger proportion of student service members/veterans reported a psychiatric diagnosis than students without military service (27.0% and 20.4%, respectively, $p<.05$), but the groups did not differ in terms of crude prevalence of self-harm, suicidal ideation, or suicide attempt. Significantly more student service members/veterans than students without military service reported seeking mental health services from all four different types of service providers, but the groups did not differ in their use of college/university mental health services. Among student service members/veterans, those with hazardous duty reported more alcohol use and were more likely to have a psychiatric diagnosis than student service members/veterans without hazardous duty experience (31.9% vs. 22.2%, respectively, $p<.05$).

After adjusting for covariates and demographic characteristics (see Table 3), student service members/veterans did not differ from students without military service in odds of psychiatric diagnosis (OR=1.17, 95% CI: 0.95–1.46), suicidal ideation (OR=1.34, 95% CI: 0.95–1.89) or suicide attempt (OR=1.35, 95% CI: 0.58–3.16). Student service members/veterans did, however, have significantly increased odds of self-harm when compared with students without military service (OR=1.83, 95% CI: 1.22–2.76). Models in Table 3 show multiple logistic regression models among only student service members/veterans in order to examine the association of hazardous duty with the outcomes. Student service members/veterans with hazardous duty had twice the odds of a psychiatric diagnosis than their student service member/veteran peers without hazardous duty, but they had a statistically significant 59% decrease in odds of past 12-months suicidal ideation (see Table 4).

COMMENT

The present findings are among the first to examine differences in correlates and indicators of suicidal thoughts and behaviors among a large national sample of students by service member/veteran status. It is also the first study to examine outcomes among student service member/veteran based on self-reported experiences of hazardous duty. The results supported only the hypotheses that (1) student service members/veterans would experience significantly higher odds of self-harm than their peers without military service experience and (2) student service members/veterans with hazardous duty experience would have higher odds of a psychiatric diagnosis than their student service member/veteran peers without hazardous duty experience.

In this sample, there was no difference among student service member/veteran and students without military service in odds of suicidal ideation or suicide attempt. The results seem to differ from the only other study to examine mental health and suicide risk among student veterans. For example, using the revised 4-item Suicide Behavior Questionnaire, Rudd and colleagues found that 10.4% of student veterans in their sample reported past-year suicidal ideation either *often* or *very often*; an estimate that likely would be higher had it included the other response categories of *rarely* and *sometimes*. In contrast, the prevalence of past 12-months suicidal ideation (yes/no) was 6.7% among student service members/veterans from the sample in the present analysis, which did not significantly differ from students without military service. It is important to note that direct comparison between these two studies is limited due to differences in survey items and sampling design. Further research is needed to replicate and compare the findings of these respective studies in order to more accurately assess the epidemiology of suicidal thoughts and behaviors among student service members/veterans.

Interestingly, hazardous duty had a negative association with suicidal ideation. Specifically, student service members/veterans with hazardous duty were significantly less likely to report suicidal ideation than their student service member/veteran peers without hazardous duty. This finding is particularly profound since the association persisted after adjusting for lifetime and past 12-months psychiatric service utilization. That is, even though student service members/veterans with hazardous duty had greater odds of having psychiatric care in the past 12 months, this characteristic did not fully explain the lower odds for suicidal

ideation. It is possible that student service members/veterans with hazardous duty experience may under-report suicidal ideation for several reasons, such as stigma and unwanted potential hospitalization.³⁷ Further research with additional samples of student service member/veteran is needed to corroborate this finding and explore explanations for it. For instance, studies with comparison groups of non-college attending service members/veterans would help to clarify if college-attending service members/veterans may represent a self-selected resilient group, since they met requirements for and are actively pursuing higher education.

After adjusting for other demographic characteristics and psychiatric diagnoses, student service member/veteran status was significantly associated with higher odds of self-harm. Relative to information about suicide risk, much less is known regarding self-harm among service persons and veterans. In one of the first studies of self-harm among veterans, Kleespies and colleagues examined interviews with VHA-utilizing veterans following self-harm requiring medical attention. They noted that over half of the sample of veterans with self-harm also had a history of attempted suicide,³⁸ which aligned with previous research documenting co-occurrence of self-reported self-harm behavior and suicide attempts.^{39,40} Thus, it is possible that some reports of self-harm in this sample actually may have included suicide attempts.⁴¹ Unfortunately, the survey did not assess suicidal intent involved in an incident of deliberate self-harm. Further studies with veterans are needed to examine self-harm and suicidal intent involved in self-harm.

This is among the first studies to examine the use of mental health services in a population of student service members/veterans. In particular, a significantly greater proportion of student service members/veterans than students without military service reported seeking counseling from clergy or other faith-based providers. Previous studies suggest that some veterans may be more willing to seek help from a pastoral care provider as opposed to using specialty mental health services^{42–44}. Additionally, considering the relatively young age of the sample population, the use of pastoral care services by college-aged veterans may be a practice carried over from time spent in active duty. Military chaplains serve as front-line providers to service members in need, effectively acting as gatekeepers for mental health professionals.⁴⁵ Further research on pastoral care for mental health among student service members/veterans may offer unique insight to their help-seeking behaviors, such as preferences for mental health care, access to care, and potential partnerships between universities and faith-based organizations.

Limitations

The results here must be viewed in light of several limitations. First, the data are cross-sectional, which preclude examination of causality. Second, misclassification bias may have resulted in defining student service members/veterans since history of military service was self-reported rather than from official records. Moreover, characteristics of military service were not available (e.g., active duty and ever served were combined in the survey question and period of service was not ascertained). Third, the term *hazardous duty* was not defined in the survey, and thus cannot be interpreted as a measure of more specific experiences, such as combat exposure and combat-related trauma. For example, *hazardous duty* as defined by

the Department of Defense for payment purposes includes experiences such as exposure to toxic chemicals, demolition of explosives, and hostile fire.⁴⁶ Consequently, in the data used for this study it is unclear which type(s) of hazardous duty the respondents experienced or whether respondents were self-selected or assigned hazardous duty. Fourth, the measure of self-harm was a single item and did not assess the intent behind the self-harm (i.e., non-suicidal vs. suicidal). Finally, there may be selection bias among this student service members/veterans sample since this group was currently enrolled in postsecondary education, which may indicate the sample was healthier than those unable or unwilling to enroll in higher education.

Conclusions

The era that began access to higher education for veterans with Franklin D. Roosevelt's signing of the Servicemen's Readjustment Act (G.I. Bill) seems worlds away.⁴⁷ Just as warfare has changed dramatically in the seven decades since the G.I. Bill, the landscape of education has transformed. The culmination of those changes intersect with the over 830,000 veterans who used their VA education benefits in 2011, the vast majority of whom are veterans of wars in Afghanistan and Iraq. As college campuses begin initiatives to reach out to their student service members/veterans,⁴⁸ there is a clear need to focus attention on the mental health needs of the women and men working to integrate the roles of students into their identities as service members/veterans.

Similar to previous findings with college populations,^{14,16,19} the crude prevalence of suicidal ideation and suicide attempt in this college sample, regardless of student service member/veteran status, were higher than general population¹⁸ and reiterate suicide risk as a public health imperative for this population. In particular, while student service members/veterans in this sample did not have higher odds of suicidal ideation or suicide attempt than students without military service, they had significantly higher odds of reporting self-harming behavior compared to students without military service. Health care providers who work with student service members/veterans may need to better understand and assess the phenomenon of self-harm as distinct from attempted suicide⁴⁰ yet highly predictive of suicide.²⁷ Epidemiologic and clinical questions about suicide risk among student service members/veterans should include the use of appropriate questions that can assess whether suicidal intent is involved in self-harm behaviors.

Acknowledgments

The authors thank the American College Health Association for use of the Fall 2011 National College Health Assessment data.

FUNDING

This work was partially supported by the VISN2 Center of Excellence for Suicide Prevention, a postdoctoral fellowship to JRB in an institutional National Research Service Award from the National Institute of Mental Health (5T32MH020061), and a postdoctoral fellowship to JRB through the Department of Veterans Affairs Office of Academic Affiliations and the Center for Health Equity Research and Promotion at the VA Pittsburgh Healthcare System. The opinions expressed in this work are the authors' and do not reflect those of the funders, institutions, the Department of Veterans Affairs, or the U.S. Government.

References

1. Department of Veterans Affairs. [Accessed January 15, 2013] Utilization: National Center for Veterans Analysis and Statistics: Department of Veterans Affairs Education Program Beneficiaries: FY2000 to FY2011. 2010. http://www.va.gov/vetdata/docs/Utilization/EducNation_2011FINAL.xls
2. Rudd MD, Goulding J, Bryan CJ. Student veterans: A national survey exploring psychological symptoms and suicide risk. *Professional Psychology: Research and Practice*. 2011; 42(5):354–360.
3. Miller M, Barber C, Young M, Azrael D, Mukamal K, Lawler E. Veterans and suicide: A re-examination of the National Death Index-linked National Health Interview Survey. *American Journal of Public Health*. 2012; 102(S1):S155–S159.
4. McCarthy JF, Valenstein M, Kim HM, Ilgen M, Zivin K, Blow FC. Suicide Mortality Among Patients Receiving Care in the Veterans Health Administration Health System. *American Journal of Epidemiology*. Apr 15; 2009 169(8):1033–1038. [PubMed: 19251753]
5. Kang HK, Bullman TA. Is there an epidemic of suicides among current and former U.S. military personnel? *Annals of Epidemiology*. 2009; 19(10):757–760. [PubMed: 19628411]
6. Kuehn BM. Soldier suicide rates continue to rise. *JAMA: The Journal of the American Medical Association*. 2009; 301(11):1111–1113. [PubMed: 19293405]
7. Kaplan MS, McFarland BH, Huguet N, Valenstein M. Suicide risk and precipitating circumstances among young, middle-aged, and older male veterans. *American Journal of Public Health*. 2012; 102(S1):S131–S137. [PubMed: 22390587]
8. Guerra VS, Calhoun PS. Examining the relation between posttraumatic stress disorder and suicidal ideation in an OEF/OIF veteran sample. *Journal of Anxiety Disorders*. 2011; 25(1):12–18. [PubMed: 20709493]
9. Brenner LA, Ignacio RV, Blow FC. Suicide and traumatic brain injury among individuals seeking Veterans Health Administration services. *Journal of Health Trauma Rehabilitation*. 2011; 26(4): 257–264.
10. Bryan CJ, Ray-Sannerud B, Morrow CE, Etienne N. Guilt is more strongly associated with suicidal ideation among military personnel with direct combat exposure. *Journal of Affective Disorders*. 2013; 148(1):37–41. [PubMed: 23232420]
11. Maguen S, Metzler TJ, Bosch J, Marmar CR, Knight SJ, Neylan TC. KILLING IN COMBAT MAY BE INDEPENDENTLY ASSOCIATED WITH SUICIDAL IDEATION. *Depression and Anxiety*. 2012; 29(11):918–923. [PubMed: 22505038]
12. Mitchell MM, Gallaway MS, Millikan AM, Bell M. Interaction of combat exposure and unit cohesion in predicting suicide-related ideation among post-deployment soldiers. *Suicide and Life-Threatening Behavior*. 2012; 42(5):486–494. [PubMed: 22934836]
13. Garlow SJ, Rosenberg J, Moore JD, et al. Depression, desperation, and suicidal ideation in college students: results from the American Foundation for Suicide Prevention College Screening Project at Emory University. *Depression and Anxiety*. 2008; 25(6):482–488. [PubMed: 17559087]
14. Zivin K, Eisenberg D, Gollust SE, Golberstein E. Persistence of mental health problems and needs in a college student population. *Journal of Affective Disorders*. 2009; 117:180–185. [PubMed: 19178949]
15. Eisenberg D, Hunt J, Speer N, Zivin K. Mental Health Service Utilization Among College Students in the United States. *The Journal of Nervous and Mental Disease*. 2011; 199(5):301–308. 310.1097/NMD.1090b1013e3182175123. [PubMed: 21543948]
16. Blanco C, Okuda M, Wright C, et al. Mental health of college students and their non-college-attending peers: Results from the National Epidemiologic Study on Alcohol and Related Conditions. *Archives of General Psychiatry*. 2008; 65(12):1429–1437. [PubMed: 19047530]
17. Whitlock J, Eckenrode J, Silverman D. Self-injurious Behaviors in a College Population. *Pediatrics*. Jun; 2006 117(6):1939–1948. [PubMed: 16740834]
18. Crosby AE, Han B, Ortega LAG, Parks SE, Gfroerer J. Suicidal thoughts and behaviors among adults aged 18 years, United States, 2008–2009. *MMWR: Morbidity & Mortality Weekly Report*. 2011; 60(13):1–22.

19. American College Health Association. American College Health Association-National College Health Assessment spring 2008 reference group data report (abridged). *Journal of American College Health*. 2009; 57(5):477–488. [PubMed: 19254888]
20. Fliege H, Lee J, Grimm A, Klapp BF. Risk factors and correlates of deliberate self-harm behavior: A systematic review. *Journal of Psychosomatic Research*. 2009; 66(6):477–493. [PubMed: 19446707]
21. Whitlock J, Muehlenkamp J, Purington A, et al. Nonsuicidal Self-injury in a College Population: General Trends and Sex Differences. *Journal of American College Health*. 2011 Nov 01; 59(8): 691–698. [PubMed: 21950249]
22. Barry AE, Whiteman S, Wadsworth SM, Hitt S. The alcohol use and associated mental health problems of student service members/veterans in higher education. *Drugs: Education, Prevention, and Policy*. 2012; 19(5):415–425.
23. Barry AE, Whiteman S, MacDermid-Wadsworth SM. Implications of posttraumatic stress among military-affiliated and civilian students. *Journal of American College Health*. 2012; 60(8):562–573. [PubMed: 23157198]
24. McFarland BH, Kaplan MS, Huguet N. Self-inflicted deaths among women with U.S. military service: A hidden epidemic? *Psychiatric Services*. 2010; 61(12):1177. [PubMed: 21123398]
25. Blosnich JR, Bossarte RM, Silenzio VMB. Suicidal ideation among sexual minority veterans: Results from the 2005–2010 Massachusetts Behavioral Risk Factor Surveillance Survey. *American Journal of Public Health*. 2012; 102(S1):S44–S47. [PubMed: 22390600]
26. Gradus JL, Street AE, Suvak MK, Resick PA. Predictors of Suicidal Ideation in a Gender-Stratified Sample of OEF/OIF Veterans. *Suicide and Life-Threatening Behavior*. 2013 n/a-n/a.
27. HAWTON K, ZAHL D, WEATHERALL R. Suicide following deliberate self-harm: long-term follow-up of patients who presented to a general hospital. *The British Journal of Psychiatry*. Jun 1; 2003 182(6):537–542. [PubMed: 12777346]
28. Cooper J, Kapur N, Webb R, et al. Suicide after deliberate self-harm: A 4-year cohort study. *American Journal of Psychiatry*. 2005; 162(2):297–303. [PubMed: 15677594]
29. Klonsky ED, Oltmanns TF, Turkheimer E. Deliberate self-harm in a nonclinical population: Prevalence and psychological correlates. *American Journal of Psychiatry*. 2003; 160:1501–1508. [PubMed: 12900314]
30. Sacks MB, Flood AM, Dennis MF, Hertzberg MA, Beckham JC. Self-mutilative behaviors in male veterans with posttraumatic stress disorder. *Journal of Psychiatric Research*. 2008; 42(6):487–494. [PubMed: 17606271]
31. American College Health Association. American College Health Association National College Health Assessment Spring 2006 Reference Group Data Report (Abridged): The American College Health Association. *Journal of American College Health*. 2007 Jan 01; 55(4):195–206. [PubMed: 17319325]
32. American College Health Association. American College Health Association-National College Health Assessment II: Reference group data report Fall 2011. Hanover, MD: American College Health Association; 2012.
33. King M, Semlyen J, Tai S, et al. A systematic review of mental disorder, suicide, and deliberate self harm in lesbian, gay and bisexual people. *BMC Psychiatry*. 2008; 8(1):70. [PubMed: 18706118]
34. Nock MK, Borges G, Bromet EJ, Cha CB, Kessler RC, Lee S. Suicide and suicidal behavior. *Epidemiologic Reviews*. 2008; 30:133–154. [PubMed: 18653727]
35. Cherpitel CJ, Borges GLG, Wilcox HC. Acute Alcohol Use and Suicidal Behavior: A Review of the Literature. *Alcoholism: Clinical and Experimental Research*. 2004; 28:18S–28S.
36. Wilcox HC, Conner KR, Caine ED. Association of alcohol and drug use disorders and completed suicide: an empirical review of cohort studies. *Drug and Alcohol Dependence*. 2004; 76(S1):S11–S19. [PubMed: 15555812]
37. Ganzini L, Denneson LM, Press N, et al. Trust is the basis for effective suicide risk screening and assessment in Veterans. *Journal of General Internal Medicine*. 2013; 28(9):1215–1221. [PubMed: 23580131]

38. Kleespies P, AhnAllen C, Knight J, et al. A study of self-injurious and suicidal behavior in a veteran population. *Psychological Services*. 2011; 8(3):236–250.
39. Swahn M, Ali B, Bossarte R, et al. Self-harm and suicide attempts among high-risk, urban youth in the U.S.: Shared and unique risk and protective factors. *International Journal of Environmental Research and Public Health*. 2012; 9(1):178–191. [PubMed: 22470286]
40. Nock MK, Joiner TE, Gordon KH, Lloyd-Richardson E, Prinstein MJ. Non-suicidal self-injury among adolescents: Diagnostic correlates and relation to suicide attempts. *Psychiatry research*. 2006; 144(1):65–72. [PubMed: 16887199]
41. Ikeda R, Mahendra R, Saltzman L, et al. Nonfatal self-inflicted injuries treated in hospital emergency departments - United States, 2000. *Morbidity and Mortality Weekly Report*. 2002; 51(20):436–438. [PubMed: 12056500]
42. Kirchner JE, Farmer MS, Shue VM, Blevins D, Sullivan G. Partnering with communities to address the mental health needs of rural veterans. *Journal of Rural Health*. 2011; 27:416–424. [PubMed: 21967386]
43. Bonner LM, Lanto AB, Bolkan C, et al. Help-seeking from clergy and spiritual counselors among veterans with depression and PTSD in primary care. *Journal of Religion and Health*. 2013 e-publication ahead of print.
44. Tanielian, TR.; Jaycox, LH. *Invisible wounds of war: Psychological and cognitive injuries, their consequences, and services to assist recovery*. Santa Monica, CA: RAND Corporation; 2008.
45. Besterman-Dahan K, Gibbons SW, Barnett SD, Hickling EJ. The role of military chaplains in mental health care of the deployed service member. *Military Medicine*. 2012; 177(9):1028–1033. [PubMed: 23025131]
46. Defense Finance and Accounting Service. [Accessed August 21, 2013] Special and incentive pays. 2011. <http://www.dfas.mil/militarymembers/payentitlements/specialpay.html>
47. Department of Veterans Affairs. [Accessed January 22, 2013] The GI Bill's History. 2012. http://www.gibill.va.gov/benefits/history_timeline/index.html
48. Smith-Osborne AM. Supporting resilience in the academic setting for student soldiers and veterans as an aspect of community reintegration: The design of the Student Veteran Project Study. *Advances in Social Work*. 2012; 13(1):34–50.

Table 1

Demographics, by Service Member/Veteran Status

	Service Member/Veteran		No Military Experience	
	Without Hazardous Duty (n= 362)	With Hazardous Duty (n=344)	Overall (n=706)	(n= 26,678)
	n (%)	n (%)	n (%)	n (%)
<u>Age (Mean, SD)</u>	29.4 (11.5) ^a	31.9 (9.4)	30.6 (10.6) ^b	22.0 (5.78)
<u>Sex</u>				
Males	208 (58.1) ^a	254 (75.8)	462 (66.7) ^b	8,468 (31.9)
Females	150 (41.9)	81 (24.2)	231 (33.3)	18,039 (68.1)
<u>Enrollment Status</u>				
Part-time/Other	44 (12.2)	55 (16.2)	99 (14.1) ^b	1,931 (7.3)
Full-time	317 (87.8)	285 (83.8)	602 (85.9)	24,565 (92.7)
<u>Race/Ethnicity^f</u>				
White	266 (73.9) ^a	256 (75.1)	522 (74.5) ^b	18,632 (70.2)
Black	18 (5.0)	13 (3.8)	31 (4.4)	1,094 (4.1)
Asian	16 (4.4)	4 (1.2)	20 (2.8)	2,139 (8.1)
Multiple races	27 (7.5)	32 (9.4)	59 (8.4)	2,383 (9.0)
Other race	4 (1.1)	12 (3.5)	16 (2.3)	496 (1.9)
Hispanic	29 (8.1)	24 (7.0)	53 (7.6)	1,786 (6.7)
<u>Sexual Orientation</u>				
Heterosexual	329 (91.6)	322 (94.7)	651 (93.1)	24,379 (92.2)
Gay/Lesbian/Bisexual/Unsure	30 (8.4)	18 (5.3)	48 (6.9)	2,059 (7.8)

^a p<.05 in bivariate analyses by student service member/veterans with and without hazardous duty^b p<.05 in bivariate analyses by student service member/veteran and students without military experience^f Racial categories are non-Hispanic

Table 2

Mental Health Outcomes and Service Utilization, by Service Member/Veteran Status

	Service Member/Veteran		No Military Experience	
	Without Hazardous Duty n (%)	With Hazardous Duty n (%)	Overall n (%)	n (%)
<u>Stress Level¹</u>				
None	5 (1.4)	6 (1.7)	11 (1.6)	436 (1.6)
Less than average	30 (8.3)	29 (8.5)	59 (8.4)	2,003 (7.5)
Average	130 (36.1)	131 (38.3)	261 (37.2)	10,065 (37.9)
More than average	138 (38.3)	144 (42.1)	282 (40.2)	11,385 (42.9)
Tremendous	57 (15.8)	32 (9.4)	89 (12.7)	2,674 (10.1)
<u>Alcohol Use</u>				
No use in past 30 days	146 (40.7) ^a	113 (33.1)	259 (36.7)	10,029 (37.6)
1–2 days	73 (20.3)	64 (18.8)	137 (19.4)	4,529 (16.9)
3–5 days	50 (13.9)	60 (17.6)	110 (15.6)	4,325 (16.2)
6–9 days	40 (11.1)	40 (11.7)	80 (11.3)	3,864 (14.5)
10–19 days	30 (8.4)	39 (11.4)	69 (9.8)	2,794 (10.5)
20–29 days	16 (4.5)	17 (5.0)	33 (4.7)	704 (2.6)
Used daily	4 (1.1)	8 (2.3)	12 (1.7)	223 (0.8)
Psychiatric Diagnosis ¹	76 (22.2) ^a	105 (31.9)	181 (27.0) ^b	5,198 (20.4)
Self-harm ¹	19 (5.3)	14 (4.1)	33 (4.7)	1,373 (5.2)
Suicidal Ideation ¹	29 (8.1)	18 (5.2)	47 (6.7)	1,749 (6.6)
Suicide Attempt ¹	4 (1.1)	5 (1.5)	9 (1.3)	289 (1.1)
<u>Ever Received Mental Health Services from:</u>				
Counselor/Therapist/Psychologist	153 (42.7)	139 (40.6)	292 (41.7) ^b	9,296 (35.1)
Psychiatrist	72 (20.1)	73 (21.4)	145 (20.7) ^b	3,451 (13.1)
Other medical professional	62 (17.3)	59 (17.3)	121 (17.3) ^b	3,844 (14.6)
Religious leader	50 (14.1)	51 (15.1)	101 (14.6) ^b	1,872 (7.1)
Ever Received Mental Health Services from University/College	48 (13.5) ^a	30 (8.7)	78 (11.1)	3,476 (13.1)

p < .05 in comparisons between student service member/veteran and students without military experience

p < .05 in comparisons between student service member/veterans with and without hazardous duty

p Past 12 months

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 3

Adjusted Odds Ratios of Mental Health Outcomes

	Psychiatric Diagnosis ^I (n=24,745)		Self-harm ^I (n=24,695)		Suicidal Ideation ^I (n=24,702)		Suicide Attempt ^I (n=24,658)	
	AOR (95%CI)		AOR (95%CI)		AOR (95%CI)		AOR (95%CI)	
Age	1.02 (1.01–1.02)*		0.89 (0.87–0.91)*		0.94 (0.92–0.95)*		0.93 (0.90–0.96)*	
Sex	0.81 (0.75–0.88)*		0.83 (0.72–0.96)*		1.34 (1.19–1.51)*		1.22 (0.92–1.61)	
Race/Ethnicity	1.37 (1.26–1.48)*		0.78 (0.68–0.89)*		0.77 (0.69–0.87)*		0.76 (0.58–1.01)	
Enrollment Status	1.17 (1.02–1.34)*		1.41 (1.11–1.79)*		1.29 (1.04–1.58)*		1.21 (0.74–1.98)	
Sexual Orientation	1.58 (1.41–1.78)*		2.91 (2.50–3.39)*		2.64 (2.30–3.04)*		2.61 (1.93–3.53)*	
Stress ^I	1.54 (1.47–1.62)*		1.74 (1.60–1.89)*		2.40 (2.22–2.59)*		1.66 (1.40–1.98)*	
Alcohol Use	1.02 (0.99–1.04)		1.06 (1.02–1.10)*		1.02 (0.99–1.06)		1.05 (0.97–1.14)	
Ever received mental health services	10.99 (10.10–11.96)*		1.74 (1.50–2.02)*		1.84 (1.61–2.10)*		1.54 (1.09–2.16)*	
Any Psychiatric Diagnosis ^I	-		2.69 (2.34–3.10)*		2.58 (2.28–2.93)*		4.30 (3.15–5.89)*	
Service Member/Veteran	1.17 (0.95–1.46)		1.83 (1.22–2.76)*		1.34 (0.95–1.89)		1.35 (0.58–3.16)	

Note: AOR=adjusted odds ratio; CI=confidence interval

^I Past 12 months

Reference categories: Sex (Female); Race/Ethnicity (Racial/Ethnic Minority); Enrollment status (Full-time); Sexual orientation (Heterosexual); Service Member/Veteran (no military experience)

* p<.05

Table 4
Adjusted Odds Ratios of Mental Health Outcomes among Student Service Members/Veterans

	Psychiatric Diagnosis ¹ (n=638) AOR (95%CI)	Self-harm ¹ (n=635) AOR (95%CI)	Suicidal Ideation ¹ (n=636) AOR (95%CI)
Age	1.04 (1.02–1.06)*	0.97 (0.93–1.01)	0.96 (0.93–1.00)
Sex	0.74 (0.47–1.19)	1.15 (0.48–2.73)	1.14 (0.54–2.38)
Race/Ethnicity	1.37 (0.83–2.27)	0.43 (0.18–0.99)*	0.87 (0.40–1.93)
Enrollment Status	1.05 (0.57–1.94)	2.29 (0.81–6.42)	2.21 (0.89–5.44)
Sexual Orientation	1.71 (0.78–3.76)	4.35 (1.60–11.82)*	2.03 (0.74–5.51)
Stress ¹	1.34 (1.03–1.74)*	1.46 (0.89–2.41)	1.85 (1.19–2.87)*
Alcohol Use	1.09 (0.96–1.24)	1.01 (0.78–1.29)	0.98 (0.79–1.22)
Ever received mental health services	11.07 (6.67–18.39)*	1.54 (0.53–4.42)	1.99 (0.81–4.88)
Any Psychiatric Diagnosis ¹	- -	4.57 (1.70–12.30)*	4.01 (1.79–9.02)*
Hazardous Duty ²	2.00 (1.30–3.07)*	0.42 (0.17–1.00)	0.41 (0.20–0.85)*

Note: AOR=adjusted odds ratio; CI=confidence interval; Suicide attempt not modeled due to rarity/small sample size

¹ Past 12 months

² Reference group is student service members/veterans without hazardous duty.

Analyses adjusted for age, sex, race/ethnicity, enrollment status, sexual orientation, past 12-months stress level, past 30-days alcohol use, and ever received mental health services. See Table 3 footnote for reference categories. Models for self-harm and suicidal ideation are also adjusted for past 12-months psychiatric diagnosis.

* p<.05