HHS Public Access

Author manuscript

Mil Behav Health. Author manuscript; available in PMC 2017 October 31.

Published in final edited form as:

Mil Behav Health. 2017 ; 5(4): 393–405. doi:10.1080/21635781.2017.1333067.

Social Support, Help-Seeking, and Mental Health Outcomes Among Veterans in Non-VA Facilities: Results from the Veterans' Health Study

Richard E. Adams[a], **Thomas G. Urosevich**[b], **Stuart N. Hoffman**[b], **H. Lester Kirchner**[b], **Johanna C. Hyacinthe**[b], **Charles R. Figley**[c], **Joseph J. Boscarino**[d], and **Joseph A. Boscarino**[b]

[a]Department of Sociology, Kent State University, Kent, Ohio

[b]Geisinger Clinic, Danville, Pennsylvania

[c]Tulane Traumatology Institute, Tulane University, New Orleans, Louisiana

[d]William James College, Newton, Massachusetts

Abstract

Using a stress process model, the authors examined social and psychological resources to better understand mental health outcomes among veterans. For this study, we surveyed 700 U.S. veterans who were outpatients in the Geisinger Health System. Independent variables included demographic factors, stressful and traumatic events, social support measures, and psychosocial factors. Using logistic regression, the authors examined 4 types of social connections: social support, help-seeking support, social capital, and other mental health support to predict mental health outcomes, including posttraumatic stress disorder, depression, suicide ideation, alcohol misuse, mental health service use, and Veterans Affairs service use. Results suggested that help-seeking support since deployment was a risk factor for 5 adverse outcomes, whereas social support was protective for 1 outcome. We concluded that high levels of help-seeking support since deployment among veterans was associated with a higher prevalence of mental health problems. These findings were unexpected and suggest the need for additional social support-related research among veterans.

Keywords

Social connections; social support; mental health problems; treatment seeking

Introduction

Studies have shown that veterans deployed to combat zones are often at risk for posttraumatic stress disorder (PTSD), depression, substance use disorders, and other mental health problems (Fox et al., 2016; Hoge, Auchterlonie, & Milliken, 2006; Milliken,

CONTACT: Joseph A. Boscarino, jaboscarino@geisinger.edu, Department of Epidemiology & Health Services Research, Geisinger Clinic, 100 N. Academy Avenue, 44-00, Danville, PA 17822.

Auchterlonie, & Hoge, 2007; Reger et al., 2015). Recently, attention has been paid to postdeployment experiences, their association with social connections, social support, and how these factors affect mental health outcomes and service use (Adler & Castro, 2013; Mustillo et al., 2015; Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009; Smith, Benight, & Cieslak, 2013; Sripada, Lamp, Defever, Venners, & Rauch, 2016; Tsai, Harpaz-Rotem, Pietrzak, & Southwick 2012). In the current study, we examined this subject using the stress process model used in previous research (Adams et al., 2002; Pearlin, Menaghan, Lieberman, & Mullan, 1981; Pearlin & Bireman, 2013).

Premised on the concept that all individuals experience negative life events (Pearlin & Bireman, 2013; Turner, Wheaton, & Lloyd, 1995; Wheaton, Young, Montazer, & Stuart-Lahman, 2013), the stress process model suggests that a life event is stressful to the extent that it requires the individual to change his or her behavior, cognitive processes, or emotional assessment to meet the challenge presented. More precisely, *stressors* are "conditions of threat, challenge, demands, or structural constraints that, by the very fact of their occurrence or existence, call into question the operating integrity of the organism" (Wheaton et al., 2013, p. 300).

The stress process model further suggests that the association between exposure to a stressful/traumatic event and mental status should be considered within the context of demographic factors, psychological resources, such as self-esteem and resilience, and the social connections available at the time (Pearlin & Bireman, 2013; Wheaton et al., 2013). However, not all stressors are the same. Some negative events like divorce may require less adjustment than more traumatic events like childhood sexual abuse or large-scale community disasters (Brewin, Andrews, & Valentine, 2000; Boscarino & Adams, 2009; Boscarino, Hoffman, Adams, Figley, & Solhkhah, 2014; Bromet et al., 2016; Wheaton et al., 2013). Even though research suggests that the majority of individuals in the United States have experienced at least one lifetime traumatic event, most do not suffer long-term psychological or physical health consequences as a result (Boscarino & Adams, 2009; Breslau et al., 1998; Bromet et al., 2016). Typically, individuals use both psychological and social resources to cope with stressful and traumatic events. Psychological resources and coping skills are key aspects of an individual's personality and include self-esteem and psychological resilience (Pearlin & Bireman, 2013; Thoits, 2010, 2011). In addition, individuals can use their social connections to help reduce the harm of stressful events (Boscarino, 1995; Thoits, 2010). Social connections, also called *social support*, can provide an individual with information or emotional support that can be used to deal with the challenges of a stressful event (Pearlin & Bireman, 2013; Thoits, 2011; Wheaton et al., 2013).

Although the stress process model has been used extensively by researchers to examine the linkages between stressful events, psychological and social resources, and health outcomes in community and special population studies (Adams, Boscarino, & Galea, 2006; Levy, & Sidel, 2009; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993; Thoits, 2010), until recently, it has been used less often in studies of military personnel (Adler & Castro, 2013). Yet, exposure to stressful events is one of the hallmarks of deployment to combat zones and a significant body of research shows that these experiences have negative consequences for military personnel when they return (Boscarino, 1995, 2007; Boscarino, Hoffman,

Pitcavage, & Urosevich, 2015; Hoge et al., 2004; Levy & Sidel, 2009; Milliken et al., 2007; Seal, Bertenthal, Miner, Sen, & Marmar, 2007). In a series of studies by Hoge and his colleagues (Hoge et al., 2004, 2006; Milliken et al., 2007), for example, combat duty was related to exposure to multiple traumatic events and the onset of mental health problems. They also reported that about 16% of Iraq war veterans met study criteria for major depression, generalized anxiety disorder or PTSD, while 11% of Afghanistan veterans met criteria for these disorders. Finally, the study found that only 23% to 40% of veterans with mental health problems sought treatment, mostly due to perceived stigmatization and other barriers.

However, consistent with predictions from the stress process model, not all veterans are equally vulnerable to psychological disorders from the stress of combat exposure. Some studies suggest that younger veterans have higher rates of mental health problems compared to older veterans from the same warzone (Seal et al., 2007). The wars in Iraq and Afghanistan also may be more stressful because of multiple war-zone tours, high combat exposure, and longer deployments compared to earlier wars (Fox et al., 2016). Other traumatic events such as having a history of childhood abuse or neglect also increase the likelihood of mental health problems postdeployment (Cabrera, Hoge, Bliese, Castro, & Messer, 2007; LeardMann, Smith, & Ryan, 2010).

In brief, our study uses the stress process model to guide our research strategy, which has been used in numerous studies linking stress, social connections, and social support to mental health outcomes and service utilization (Boscarino et al., 2015; Thoits, 2010; Turner et al., 1995). This analytical model has utility in physical and mental health research conducted among veterans because it facilitates intervention-focused strategies based on a robust psychosocial knowledge base in behavioral health sciences (Adams et al., 2002; Boscarino et al., 2014; Yamashita, 2012). In this study, measures of social connections, such as social support, social capital, and help-seeking support, are the main independent variables of interest. Our research question is “To what extent do social connections (i.e., social support, social capital, help-seeking support, etc.) impact mental health outcomes and mental health service utilization among formerly deployed veterans?” Our hypothesis is that the more social support and social connections veterans have, the fewer mental health problems they will experience and the lower the occurrence of mental health service utilization.

Methods

Data for the study were collected by means of a telephone survey of U.S. military veterans, between the ages of 22 and 74, and who were outpatients of the Geisinger Health System (GHS). Participants were identified using a computer-generated algorithm and the Electronic Health Record. Geisinger routinely collects veteran status on all adult patients receiving outpatient care. After obtaining informed consent, trained interviewers recruited veterans through the use of a screener and administered a structured diagnostic interview. Interviews were conducted in English. Potential participants who were either institutionalized or incapable of completing a 45-min interview because of physical, language, or cognitive impairments were excluded. Overall, 700 previously deployed veterans completed the

survey reflecting a completion rate of about 60% (Boscarino et al., 2015). All participants had at least one warzone deployment. The Institutional Review Board of GHS reviewed and approved all protocols for this study.

Geisinger is a large, physician-led healthcare organization located in Pennsylvania and is one of the largest integrated health systems in the United States (Boscarino et al., 2016; see http://www.geisinger.org for more information). About 40,000 of GHS patients are current or former U.S. military personnel. Given its size and staffing, GHS is comparable to a large Veterans Integrated Service Network within the Veterans Affairs (VA) system for veterans located in central and northeastern Pennsylvania who use GHS for their healthcare.

As discussed elsewhere (Boscarino et al., 2015; Hoffman, Zhang, Erlich, & Boscarino, 2012), examination of veterans who completed the survey, compared to those who did not, showed few differences. Only age and marital status were found to be statistically significant, with participating veterans being younger and more often married, relative to non-participating veterans. Thus, our study sample appears to be representative of the larger GHS veteran population.

Dependent variables

The study focused on six outcome variables: PTSD, depression, suicide ideation, alcohol misuse, mental health service use, and VA service use. To assess PTSD, we used a diagnostic instrument based on the *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed. (*DSM*-IV; American Psychiatric Association, 1994). This instrument, originally developed for telephone surveys (Resnick et al., 1993), was used in other trauma studies (Amstadter, McCauley, Ruggiero, Resnick, & Kilpatrick, 2008; Boscarino, Galea, et al., 2004; Boscarino, Adams, & Figley, 2011) and showed excellent reliability and validity (Cronbach's alpha = .92). To be categorized as having lifetime PTSD, veterans had to meet full *DSM-IV* criteria (A through F) for this disorder.

Lifetime depression was assessed using a version of the Structured Clinical Interview for DSM major depressive disorder. Consistent with *DSM-IV* criteria, respondents met the criteria for depression if they had five or more depression symptoms for at least two weeks. This measure was also used in previous telephone-based surveys of trauma survivors and had good validity and reliability (Boscarino, Adams. & Figley, 2004; Boscarino et al., 2011; Boscarino, Galea, et al., 2004; Kilpatrick et al., 2003).

We used one item from *DSM-IV* major depression scale to measure Lifetime Suicide Ideation (Boscarino,, Adams, & Figley, 2004). Specifically, we asked if respondents had ever had thoughts about being better off dead or hurting them self in some way. We coded a positive response to this question as indicating lifetime suicide ideation. Many past studies using this scale have found it a valid and reliable measure of depressive symptoms (Boscarino, Galea, et al. 2004; Martin, Rief, Klaiberg, & Braehler, 2006).

The survey also inquired about past year alcohol misuse based on the CAGE Questionnaire (King, 1986), a widely used and validated four-item measure of alcohol dependence symptoms (O'Brien, 2008). Following recommended coding, those who reported two or

more CAGE symptoms in the past 12 months (e.g., thought they should cut down on drinking, criticized about drinking, etc.) were classified as having probable alcohol dependence. In the current study, the reliability results for this scale were good (Cronbach's alpha = .89).

Mental health service use was assessed using survey instruments adopted from the National Comorbidity Study. In particular, we asked participants about lifetime experience of receiving any counseling from helping professionals, including a psychiatrist, a counselor, a physician, or self-help groups like Alcoholics Anonymous, with a positive response to any of these indicating mental health service utilization. These instruments were used in previous mental health studies (Boscarino, Adams, & Figley, 2004; Boscarino, Galea, et al., 2004; Boscarino, et al., 2011). Previous reports related to the reliability and validity of these instruments suggested that they are good measures of mental health service utilization (Boscarino, Adams, & Figley, 2004; Boscarino, Galea, et al., 2004). Similarly, the survey also asked respondents about any lifetime VA service utilization.

Independent variables

Guided by a stress process model used in previous studies (Adams et al., 2006; Adams & Boscarino, 2011; Pearlin et al., 1981; Thoits, 2011; Yamashita, 2012), we assessed a number of potential mental health risk and protective factors, including demographic variables, stressful and traumatic events, social support measures, and psychosocial variables.

Demographic factors—Demographic factors included age, gender, race, marital status, education, employment, rural location, service era, and service branch. For these measures age was coded in years. Gender, race, marital status, education, employment status, rural location were coded as binary variables, with male, White race, married, college or higher education, employed full or part-time, rural location coded as the indicator variable and female, non-White, not married, less than college education, not employed, and nonrural location coded as the reference category. Service era was coded as Vietnam, Gulf War, Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF), and other. Service branch was coded as Air Force, Army, Navy, Marines, and other. All of the data for these demographic variables come from the survey, except rural location, which was based on U.S. Census data (http://www.census.gov/).

Stressful and traumatic events—We also examined several stressful and traumatic events related to childhood and adult trauma exposures. Warzone deployments were based on self-report and included the Vietnam war, Persian Gulf war, Afghanistan/Iraq wars (OED/OIF), and "other," as currently defined by the VA (http://www.va.gov). For the current analyses, we included Vietnam, Gulf War, Afghanistan/Iraq, and other veterans our study. The survey also inquired about the number of warzone deployments (coded as one vs. two more deployments). Combat exposure (low vs. high) was based on a version of the Combat Experience Scale (Hoge et al., 2004; Janes, Goldberg, Eisen, & True, 1991; Boscarino, 1995), a widely used and validated measure of combat exposure (Cronbach's alpha = .81, M = 4.2, SD = 2.4). Versions of this scale have been used in military health studies since the Vietnam war era (Boscarino, 1995; Boscarino, 2007). The current version was based on a

count of combat events experienced (e.g., ever wounded by hostile fire, ever responsible for killing enemy combatants, etc.). As in previous research (Boscarino et al., 2015), the 80th percentile was used to define higher combat exposure. Lastly, childhood adversities were measured using the 12-item scale Adverse Childhood Events scale (Cabrera et al., 2007). Items in this scale asked respondents to report how often (never, sometimes, often, or very often) as a child did a parent hit them, how often they went hungry, and other physical or psychological abuse events (Cronbach's alpha = 0.84, M = 4.9, SD = 5.3). For this study, we coded respondents into low adversities versus high adversities. Based on previous research (Boscarino et al., 2015), the 80th percentile was also used to define higher exposure to adversity.

Social support measures—Given our focus on social connections, we included measures of veterans' social relationships. First, current social support was the sum of four questions about emotional, informational, and instrumental support (e.g., having some available to help if confined to a bed), with scores less than 8 coded as low current social support and scores of 8+ coded as high current social support. Response options were none of the time, some of the time, most of the time, and all of the time. These items were based on those used in the Medical Outcomes Study (Sherbourne & Stewart, 1991), have been used in other telephone surveys (Adams et al., 2006; Boscarino, Adams, & Figley et al., 2004; Boscarino et al., 2014), and have demonstrated good validity and reliability (Cronbach's alpha = .83, M = 9,7, SD = 3.0). Second, the four items used to measure help-seeking support since deployment (e.g., getting help and advice from other people, getting emotional support from others, etc.) came from the Brief Coping Scale (Carver, 1997), a scale adopted for military deployment in the current study (Cronbach's alpha = .84, M = 4.9, SD = 3.6). The scale's response options ranged from not at all to a lot. We combined responses to the questions into a scale and coded it so that high help-seeking since deployment was compared to low help-seeking since deployment. The 80th percentile cut-point was used to define high help-seeking since deployment in the current study. Third, we asked respondents about their neighborhood and the social connections they have with their neighbors. The six true/false items from the Social Capital Scale were used for this, which inquire if the neighborhood is a good place to live, the respondent expects to live in the neighborhood for a long time, etc. (Cronbach's alpha = .68, 4.4, SD = 1.1). This scale was from the General Social Survey, a widely use ongoing national survey in the United States (National Opinion Research Center, 2009). We summed these questions and divided respondents into low social capital vs. high social capital, with the 80th percentile used to define higher social capital. Finally, the survey inquired about other types of support veterans sought. This was based on seven yes/no questions focused on seeking help for mental health and substance use problems after warzone service from family and close friends, local neighborhood or community, clergymen or spiritual advisor, etc. This measure was adapted from the instruments used in the National Comorbidity Study and used in previous trauma research (Boscarino, Adams, & Figley, 2004; Boscarino, Galea, et al., 2004). For this measure, we coded these responses into other mental health support sought since deployment (2 or more) vs. no/little other mental health support sought since deployment (<2 sources sought).

Psychosocial variables—Psychosocial variables in our study included self-esteem and psychological resilience. Self-esteem was measured by a 5-item version of the Rosenberg Scale (e.g., feel like a person of worth; certainly feel useless at times, etc.; Rosenberg, 1979), Cronbach's alpha = 0.72, $M = 18.2$, $SD = 2.6$, a scale widely used in previous trauma studies and collected on a 4-point scale ranging from 1 (*strongly agree*) to 4 (*strongly disagree*) (Boscarino & Adams, 2009; Boscarino, Hoffman, et al., 2014). The reliability and validity of this scale is good (Sinclair, Blais, Gansler, Sandberg, Bistis, & LoCicero, 2010). For this study, we coded the measure into low self-esteem (scores 4 or lower) vs. high self-esteem (scores 5 or higher). Psychological resilience was assessed by the 5-item version of the Connor-Davidson Resilience Scale (CD-RISC) (Campbell-Sills & Stein, 2007). Items in this measure included reports related to being able to adapt to change and having a strong sense of purpose, collected on a 5-point scale ranging from 1 (*not true at all*) to 5 (*true nearly all the time*) (Cronbach's alpha = .80, $M = 17{,}6$, $SD = 3.1$). CD-RISC has been extensively used in clinical research and is reported to be a valid and reliable measure of psychological resilience (Connor & Davidson, 2003). We coded the measures so that veterans with high resilience were compared to those with low resilience. As in previous research (Boscarino et al., 2015), respondents who fell below the 20th percentile were defined as having low psychological resilience.

Statistical analyses

Our statistical analyses begin with descriptive statistics and bivariate associations between the six outcomes and our measures of social connections and social support. We used logistic regression for our multivariable statistical analysis, such that demographic, stressful events, psychosocial resources, and help-seeking/social support variables estimated the likelihood of our six outcomes (PTSD, depression, suicide ideation, alcohol misuse, mental health service use, and VA service use), expressed as odds ratios (OR), controlling for other variables in the model (Hosmer & Lemeshow, 2000; Hulley, Cummings, Browner, Grady, & Newman, 2013). Given the large number of potential explanatory variables, we conducted preliminary analyses to identify variables that were statistically significant for at least one of the dependent variables (Hosmer & Lemeshow, 2000). We include only those selected variables in our final models shown below.

Results

The demographic characteristics of the sample (Table 1) show that almost 60% of veterans were between 40 and 64 years old and the majority of them were male (96%), White (93%), and married (80%). About 45% were employed either full or part-time and 49% lived in rural locations. Seventy-two percent (72%) saw service during the Vietnam War, about 10% during the Gulf War, 14% during the Afghanistan/Iraq War, and less than 5% during other conflicts. Less than 30% had multiple warzone tours and about 21% were classified as having high combat exposure. Finally, the study population reflected a range of military branches, with slightly more that 55% coming from the Army, 21% from the Air Force, 11% from the Navy, and 12% from the Marine Corps.

In terms of the social and psychological variables assessed (Table 2), less than 20% of the study population was classified as having high childhood abuse/neglect, about 28% as having low self-esteem, and about 21% as having low psychological resilience. For social support, the veterans showed good levels of support, with 78% reporting high current levels of social support, 29% having high help-seeking support levels since deployment, 65% having high social capital, and only about 15% seeking high levels of other mental health social support for problems since deployment. Participants in the study also had relatively positive mental health status. In particular, 21% reported use of psychotropic medications, less than 10% met criteria for lifetime PTSD, less than 20% met criteria for lifetime depression, less than 12% reported lifetime suicide ideation, 12% met criteria for alcohol misuse, 50% had ever used mental health services, and about 51% reported lifetime VA service use.

The bivariate associations between the four social support measures and six indicators of mental and physical well-being are shown in Table 3. As seen, all of the social connection variables were statistically related to at least two mental health outcomes. Specifically, veterans who were in the high social support group had lower lifetime depression, lower likelihood of lifetime suicide ideation, and lower rates of lifetime mental health service use. There were no differences between high and low social support for PTSD, alcohol misuse, and VA service use. For those with high help-seeking since deployment, this measure was related to meeting criteria for lifetime PTSD and major depression, high likelihood of lifetime suicide ideation, more lifetime mental health service use, and more lifetime VA service use. Social capital was related to only two outcomes, lifetime suicide ideation and alcohol misuse, such that high social capital was related to lower lifetime suicide ideation and lower alcohol misuse. In addition, high other mental health support seeking since deployment was correlated with all but one of the outcomes. This measure was associated with meeting criteria for lifetime PTSD, high lifetime depression, greater likelihood of lifetime suicide ideation, greater lifetime mental health service use, and greater lifetime VA service use. Finally, there are no statistically significant differences by location for any of the outcomes assessed. That is, rural location is not associated with any of the mental health or service use dependent variables evaluated.

Table 4 focuses on two social connection measures: social support and help-seeking support since deployment. We examine these two outcomes because they are consistently related to our six health and service utilization measures in the bivariate analysis and they reflect aspects of the stress process model that guided this research. The model with social support as the dependent variable shows that marital status, self-esteem, psychological resilience, help-seeking since deployment, and rural location are significantly related to this dependent variable. As found in other studies, married respondents are about 31/2 times more likely to report high levels of social support compared to their non-married counterparts (OR = 3.59). Low self-esteem and low psychological resilience, on the other hand, lowers the likelihood high social support (OR = 0.25 and 0.57, respectively). Help-seeking support since deployment is also related to higher levels of social support (OR = 3.43). Finally, respondent living in rural locations are about 2 times more likely to have high social support, compared to those living in suburban/urban areas (OR = 2.07). The help-seeking since deployment logistic regression reveals a slightly different set of variables predicting this outcome. For

example, being married (OR = 0.55) and living in a rural location (OR = 0.60) are associated with reduced help-seeking behavior, whereas experiencing high combat exposure (OR = 1.79), and reporting high social support (OR = 3.58) are related to greater help-seeking since deployment. Other variables like education level and childhood adversity are not associated with help-seeking behaviors.

The last set of logistic regression modes bring all of the independent variables into the analysis and attempt to assess the extent to which social support and help-seeking since deployment are related to the six mental health and service utilization outcomes, controlling for demographic factors, stressful events, and psychological resources (Table 5). As can be seen, help-seeking since deployment is related to five of the six outcomes (PTSD, depression, mental health services use, suicide ideation, and VA use), whereas social support is associated only with depression. Help-seeking since deployment, however, is associated with worse mental health outcomes and greater service use. Social support, on the other hand, is related to better mental health outcomes (i.e., lower levels of depression).

Examination of the results in detail shows that being a Vietnam veteran (OR = 5.55), having multiple combat tours (OR = 2.12), having a history of high childhood adversity (OR = 3.27), scoring low on psychological resilience (OR = 4.28), having high help-seeking since deployment (OR = 2.48), and living in a rural location (OR = 2.18) increased the chances that the respondent meets criteria for PTSD. For depression, being older (OR = 0.93), an OEF/OIF veteran (OR = 0.34), and having high social support (OR = 0.54) lowers depression risk, while having low self-esteem (OR = 2.13), a history of high child adversity (OR = 2.41), low psychological resilience (OR = 3.36), and high help-seeking since deployment (OR = 3.26) increases the likelihood of meeting the criteria for depression. Being an OEF/OIF veteran (OR = 0.21) lowers the likelihood of experiencing suicide ideation. Having low self-esteem (OR = 2.81), a history of high childhood adversity (OR = 2.67), low psychological resilience (OR = 4.58), and high help-seeking since deployment (OR = 3.52) is associated with increased suicide ideation. Alcohol misuse is only related to being employed (OR = 1.92).

Examination of mental health service use shows that being older (OR = 0.95) and a OEF/OIF veteran (OR = 0.44) is related to lower mental health service use, whereas having some college or more (OR = 1.57), low self-esteem (OR = 2.10), high combat exposure (OR = 1.64), a history of high childhood adversity (OR = 1.96), low psychological resilience (OR = 3.14), and high help-seeking since deployment (OR = 2.61) is associated with higher mental health service use. Lastly, only high combat exposure (OR = 1.87) and help-seeking since deployment (OR = 1.49) are related to use of VA services.

Discussion

In the current study, we focus on social connections in a sample of deployed veterans and the extent to which these relationships influence the likelihood of negative mental health outcomes and increases in service utilization. First, our analysis suggests certain types of social connections (e.g., social support) are associated with combat veterans' psychological well-being and reduce service utilization, while other types, such as those focused on

helping the veteran cope with mental health problems, are associated with poor mental health and high utilization. Second, OEF/OIF veterans tended to have better psychological health and lower mental health service utilization compared to veterans from other eras, which contradicts some speculation about the greater psychological problems among these veterans (Fox et al., 2016) but is consistent with other recent research (Kang et al., 2015). Third, living in a rural area had no association with service utilization (mental health or VA) and only to PTSD, supporting the idea that living outside of urban/suburban areas is not necessarily a barrier to accessing appropriate mental health services. Fourth, early childhood adversities were more consistently related to our study outcomes, than measures of stress from military service (multiple combat tours and combat exposure). Finally, demographic characteristics had only a limited role in explaining mental health and service use outcomes.

One concern about the mental health status of veterans has been the lack of care access due to rural location (Mott, Grubbs, Sansgiry, Fortney, & Cully, 2015; Weeks et al., 2004). The analysis of responses from our sample suggests that this concern may apply only to PTSD. If rural location were a barrier to mental health services, then we would likely see a statistically significant difference between those participants in rural locations and those in suburban/urban locations for the service use outcomes assessed in this study. However, there are no statistically significant differences by location for these outcomes or for the mental health outcomes in this study, except PTSD. Part of the reason for the lack of differences is that rural veterans have greater social support and are less likely to need help from others to cope with post-deployment problems, compared to their urban/suburban counterparts. Given how these results differ from past research, the need to examine health disparities among veterans living in rural relative to urban areas is still a pressing issue.

Examining social connections, we note that many of the independent variables having the opposite relationship to social support compared to help-seeking since deployment. That is, being married, having psychological resources like self-esteem and psychological resilience, and living in a rural area increase veterans' chances of having strong social support, whereas veterans who seek support from others to cope with post-deployment problems are less likely to be married, more likely to have experienced stress related to multiple combat tours, report high social support, and more likely to live in urban/suburban areas. These findings suggest that factors affecting social connections are complex. Early work on the stress process model contends that social connection and social support resources are the most useful for protecting well-being when the person experiences many stressful events (Pearlin et al., 1981; Thoits, 2010)

Veterans with many social connections (i.e., high social support and social capital) tend to have better well-being and lower service use compared to those who were more socially isolated. That is, these social connections may buffer the veteran from life events related to combat, childhood adversities, and more recent stressful events (Wheaton et al., 2013). However, those veterans who actively sought help from others since deployment (high help-seeking and high other mental health support seeking) were more likely to have mental health problems and high service use. This finding suggests that combat veterans suffering from trauma-related problems due to their military service may be receiving significant help from their informal care network, and benefit from these connections, which may partially

explain why veterans in our study have better mental health compared to other study results (Boscarino et al., 2015; Hoge et al., 2004). Future research needs to confirm the role of different types of social connections on the physical and mental health of veterans and how service-related trauma can be addressed using these informal care networks (Sripada et al., 2016). This may explain, at least partially, why veterans in our study have better mental health compared to other study results.

As with any study, our results need to be assess in light of our data's strengths and weaknesses. In terms of limitations, our interview data are cross-sectional and, therefore, precludes any assessment of causality. Future research can better assess the interconnections of social support and mental health with longitudinal data. Second, the current study only included previously deployed U.S. veterans seen at a large non-VA multihospital system in Pennsylvania, which means that our results many not generalize to all combat veterans, or veterans, more generally. Third, our sample consisted excluded veterans too ill to be surveyed and those who were institutionalized. Fourth, the findings may not generalize to women and non-White veterans because over 90% of the sample was male and White. Finally, a comparison between responders and non-responders suggested that responders were more likely to be married and younger. These sample characteristics may have biased our results in unknown ways.

Despite these limitations, the study has a number of strengths. We obtained a large sample of combat veterans from a range of warzone eras. We used standard measures of mental health status, social support, and psychological resources (self-esteem and psychological resilience) with excellent validity and reliability. Finally, we examine a range of social connections, assessed in four different ways, to better understand how they might influence veteran mental health and service use outcomes. We find that the better social support veterans have, the better their mental health and lower their service use. Conversely, it appears that veterans with worse mental health and high service use also seek help from their social network to cope with their psychological difficulties. Future research is needed to examine these possible pathways between mental health and social support.

Veterans today have a variety of healthcare options, not only seeking services at VA facilities (Boscarino, Larson, Ladd, Hill, & Paolucci, 2010). In addition, there is increasing discussion of the need to modify how healthcare is delivered to this population (Harada, Villa, & Andersen, 2002; Miller & Intrator, 2012). The challenges of providing mental health services to this population, distributed over a large geographic area of Pennsylvania covered by Geisinger, include the stigma of seeking help and the potential for not finding qualified practitioners (Blais & Renshaw, 2013). As such, it is important to study non-VA healthcare delivery systems, since some studies suggest that these providers may not be as prepared to address the physical and mental health needs of former service members (Boscarino et al., 2010; Harada et al., 2002). In addition, it is important to study these non-VA systems and how continuity of care can be furthered through the use of electronic health records (Boscarino et al., 2015). Given this medical technology, it is possible not only to conduct service use studies, but to also use it to further improve the medical and mental health care received by service members. It is likely that future policy changes may increase the burden

placed on non-VA facilities and understanding how these systems function is important to better prepare them for the services needs of veterans and to deliver higher quality care.

Acknowledgments

Funding

Funding for this research was provided by the Geisinger Auxiliary Fund, the Kline & Ditty Health Fund, the National Institute of Mental Health (Grant No. R21-MH-086317), the Wounded Warrior Project Organization, and the U.S. Department of Defense (Contract No. W81XWH-15-1-0506) to Joseph A. Boscarino.

References

Adams RE, Boscarino JA. A structural equation model of perievent panic and posttraumatic stress disorder after a community disaster. Journal of Traumatic Stress. 2011; 24:61–69. [PubMed: 21351165]

Adams RE, Boscarino JA, Galea S. Social and psychological resources and health outcomes after the World Trade Center disaster. Social Science and Medicine. 2006; 62:176–188. [PubMed: 16002196]

Adams RE, Bromet EJ, Panina N, Golovakha E, Goldgaber D, Gluzman S. Stress and well-being after the Chernobyl nuclear power plant accident. Psychological Medicine. 2002; 32:143–156. [PubMed: 11883724]

Adler AB, Castro CA. An occupational mental health model for the military. Military Behavioral Health. 2013; 1:41–51.

Amstadter AB, McCauley JL, Ruggiero KJ, Resnick HS, Kilpatrick DG. Service utilization and help seeking in a national sample of female rape victims. Psychiatric Services. 2008; 59:1450–1457. [PubMed: 19033173]

American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 4. Washington, DC: American Psychiatric Association; 1994.

Blais RK, Renshaw KD. Stigma and demographic correlates of help-seeking intentions in returning service members. Journal of Traumatic Stress. 2013; 26:77–85. [PubMed: 23335155]

Boscarino JA. Post-traumatic stress and associated disorders among Vietnam veterans: The significance of combat exposure and social support. Journal of Traumatic Stress. 1995; 8:317–336. [PubMed: 7627446]

Boscarino, JA. Vietnam veterans, postwar experiences, and health outcomes. In: Fink, G., editor. Encyclopedia of stress. 2. New York, NY: Academic Press; 2007. p. 830-838.

Boscarino JA, Adams RE. PTSD onset and course following the World Trade Center disaster: Findings and implications for future research. Social Psychiatry and Psychiatric Epidemiology. 2009; 44:887–898. [PubMed: 19277439]

Boscarino JA, Adams RE, Figley CR. Mental health service use one year after the World Trade Center disaster: Implications for mental health care. General Hospital Psychiatry. 2004; 26:346–358. [PubMed: 15474634]

Boscarino JA, Adams RE, Figley CR. Mental health service use after the World Trade Center disaster: Utilization trends and comparative effectiveness. Journal of Nervous and Mental Disease. 2011; 199:91–99. [PubMed: 21278537]

Boscarino JA, Galea S, Adams RE, Ahern J, Resnick H, Vlahov D. Mental health service and medication use in New York City after the September 11, 2001, terrorist attack. Psychiatric Services. 2004; 55:274–283. [PubMed: 15001728]

Boscarino JA, Hoffman SN, Adams RE, Figley CR, Solhkhah R. Mental health outcomes among vulnerable residents after Hurricane Sandy: Implications for disaster research and planning. American Journal of Disaster Medicine. 2014; 9:107–120. [PubMed: 25068940]

Boscarino JA, Hoffman SN, Pitcavage JM, Urosevich TG. Mental health disorders and treatment seeking among veterans in non-VA facilities: Results and implications from the Veterans' Health Study. Military Behavioral Health. 2015; 3:244–254. [PubMed: 26640743]

Boscarino JA, Kirchner HL, Pitcavage JM, Nadipelli VR, Ronquest NA, Fitpatrick MH, Han JJ. Factors associated with opioid overdose: A 10-year retrospective study of patients in a large integrated healthcare system. Substance Abuse and Rehabilitation. 2016; 7:131–141. [PubMed: 27695382]

Boscarino JA, Larson S, Ladd I, Hill E, Paolucci SJ. Mental health experiences and needs among primary care providers treating OEF/OIF veterans: Preliminary findings from the Geisinger Veterans Initiative. International Journal of Emergency Mental Health. 2010; 12:161–170. [PubMed: 21473366]

Breslau N, Kessler RC, Chilcoat HD, Schultz LR, Davis GC, Andreski P. Trauma and posttraumatic stress disorder in the community: The 1996 Detroit Area Survey of Trauma. Archives of General Psychiatry. 1998; 55:626–632. [PubMed: 9672053]

Brewin CR, Andrews B, Valentine JD. Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. Journal of Consulting and Clinical Psychology. 2000; 68:748–766. [PubMed: 11068961]

Bromet EJ, Hobbs MJ, Clouston SAP, Gonzalez A, Kotov R, Luft BJ. DSM-IV post-traumatic stress disorder among World Trade Center responders 11–13 years after the disaster of 11 September 2001 (9/11). Psychological Medicine. 2016; 46:771–783. [PubMed: 26603700]

Cabrera OA, Hoge CW, Bliese PD, Castro CA, Messer SC. Childhood adversity and combat as predictors of depression and post-traumatic stress in deployed troops. American Journal of Preventive Medicine. 2007; 33:77–82. [PubMed: 17673093]

Campbell-Sills L, Stein MB. Psychometric analysis and refinement of the Connor-Davidson Resilience Scale (CD-RISC): Validation of a 10-item measure of resilience. Journal of Traumatic Stress. 2007; 20:1019–1028. [PubMed: 18157881]

Carver CS. You want to measure coping but your protocol's too long: Consider the brief COPE. International Journal of Behavioral Medicine. 1997; 4(1):92–100. [PubMed: 16250744]

Connor KM, Davidson JR. Development of a new resilience scale: The Connor-Davidson Resilience Scale (CD-RISC). Depression and Anxiety. 2003; 18:76–82. [PubMed: 12964174]

Fox AB, Walker BE, Smith BN, King DW, King LA, Vogt D. Understanding how deployment experiences change over time: Comparison of female and male OEF/OIF and Gulf War veterans. Psychological Trauma: Theory, Research, Practice, and Policy. 2016; 8:135–140.

Harada ND, Villa VM, Andersen R. Satisfaction with VA and non-VA outpatient care among veterans. American Journal of Medical Quality. 2002; 17:155–164. [PubMed: 12153068]

Hoffman SN, Zhang X, Erlich PM, Boscarino JA. Grapheme-color synesthesia and posttraumatic stress disorder: Preliminary results from the Veterans' Health Study. Psychosomatic Medicine. 2012; 74(9):912–915. [PubMed: 23115347]

Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL. Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. New England Journal of Medicine. 2004; 351:13–22. [PubMed: 15229303]

Hoge CW, Auchterlonie JL, Milliken CS. Mental health problems, use of mental health services, and attrition from military service after returning from deployment to Iraq or Afghanistan. JAMA. 2006; 295:1023–1032. [PubMed: 16507803]

Hosmer, DW., Lemeshow, S. Applied logistic regression. 2. New York, NY: John Wiley & Sons; 2000.

Hulley, SB., Cummings, SR., Browner, WS., Grady, DG., Newman, TB. Designing clinical research. 4. Philadelphia, PA: Wolters Kluwer Health/Lippincott Williams & Wilkins; 2013.

Janes GR, Goldberg J, Eisen SA, True WR. Reliability and validity of a combat exposure index for Vietnam era veterans. Journal of Clinical Psychology. 1991; 47:80–86. [PubMed: 2026782]

Kang HK, Bullman TA, Smolenski DJ, Skopp NA, Gahm GA, Reger MA. Suicide risk among 1.3 million veterans who were on active duty during the Iraq and Afghanistan wars. Annals of Epidemiology. 2015; 25:96–100. [PubMed: 25533155]

Kilpatrick DG, Ruggiero KJ, Acierno R, Saunders BE, Resnick HS, Best CL. Violence and risk of PTSD, major depression, substance abuse/dependence and comorbidity: Results from the National Survey of Adolescents. Journal of Consulting and Clinical Psychology. 2003; 71:692–700. [PubMed: 12924674]

King M. At-risk drinking among general practice attenders: Validation of the CAGE questionnaire. Psychological Medicine. 1986; 16(1):213–217. [PubMed: 3961046]

LeardMann CA, Smith B, Ryan MAK. Do adverse childhood experiences increase the risk of post-deployment posttraumatic stress disorder in US Marines. BMC Public Health. 2010; 10:437. [PubMed: 20659342]

Levy BS, Sidel VW. Health effects of combat: A life-course perspective. Annual Review of Public Health. 2009; 30:123–136.

Martin A, Rief W, Klaiberg A, Braehler E. Validity of Brief Patient Health Questionnaire Mood Scale (PHQ-9) in the general population. General Hospital Psychiatry. 2006; 28:71–77. [PubMed: 16377369]

Miller EA, Intrator O. Veterans use of Non-VHA services: Implications for policy and planning. Social Work in Public Health. 2012; 27:379–381. [PubMed: 22657150]

Milliken CS, Auchterlonie JL, Hoge CW. Longitudinal assessment of mental health problems among active and reserve component soldiers returning from the Iraq War. JAMA. 2007; 298:2141–2148. [PubMed: 18000197]

Mott JM, Grubbs KM, Sansgry S, Fortney JC, Cully JA. Psychotherapy utilization among rural and urban veterans from 2007 to 2010. The Journal of Rural Health. 2015; 31:235–243. [PubMed: 25471067]

Mustillo SA, Kysar-Moon A, Douglas SR, Hargraves R, Wadsworth SM, Fraine M, Frazer NL. Overview of depression, post-traumatic stress disorder, and alcohol misuse among active duty service members returning from Iraq and Afghanistan, self-report and diagnosis. Military Medicine. 2015; 180:419–427. [PubMed: 25826347]

National Opinion Research Center. General Social Surveys, 1972–2008: Cumulative Codebook. Chicago, IL: National Opinion Research Center, University of Chicago, Illinois; 2009.

O'Brien CP. The CAGE questionnaire for detection of alcoholism: A remarkably useful but simple tool. JAMA. 2008; 300:2054–2056. [PubMed: 18984895]

Pearlin, LI., Bireman, A. Current issues and future directions in research into the stress process. In: Aneshensel, CS.Phelan, JC., Bireman, A., editors. Handbook of the sociology of mental health. New York, NY: Springer; 2013. p. 325-340.

Pearlin LI, Menaghan EG, Lieberman MA, Mullan JT. The stress process. Journal of Health and Social Behavior. 1981; 22:337–356. [PubMed: 7320473]

Pietrzak RH, Johnson DC, Goldstein MB, Malley JC, Southwick SM. Psychological resilience and postdeployment social support protect against traumatic stress and depressive symptoms in soldiers returning from Operations Enduring Freedom and Iraqi Freedom. Depression and Anxiety. 2009; 26:745–751. [PubMed: 19306303]

Reger MA, Smolenski DJ, Skopp NA, Metzger-Abamukang MJ, Kang HK, Bullman TA, Perdue S, Gahm GA. Risk of suicide among US military service members following Operation Enduring Freedom or Operation Iraqi Freedom deployment and separation from the US military. JAMA Psychiatry. 2015; 72:561–569. [PubMed: 25830941]

Resnick HS, Kilpatrick DG, Dansky BS, Saunders BE, Best CL. Prevalence of civilian trauma and post-traumatic stress disorder in a representative national sample of women. Journal of Consulting and Clinical Psychology. 1993; 61(6):984–991. [PubMed: 8113499]

Rosenberg, M. Conceiving the self. New York, NY: Basic Books; 1979.

Seal KH, Bertenhal D, Miner CR, Sen S, Marmar C. Bringing the war home: Mental health disorders among 103,788 US veterans returning from Iraq and Afghanistan seen in Department of Veterans Affairs facilities. Archives of Internal Medicine. 2007; 167:476–482. [PubMed: 17353495]

Sherbourne CD, Stewart AL. The MOS social support survey. Social Science and Medicine. 1991; 32:705–714. [PubMed: 2035047]

Sinclair SJ, Blais MA, Gansler DA, Sandberg E, Bistis K, LoCicero A. Psychometric properties of the Rosenberg Self-Esteem Scale: Overall and across demographic groups living within the United States. Evaluation and the Health Professions. 2010; 33:56–80. [PubMed: 20164106]

Smith AJ, Benight CC, Cieslak R. Social support and post-deployment coping self-efficacy as predictors of distress among combat veterans. Military Psychology. 2013; 25:452.

Sripada RK, Lamp KE, Defever M, Venners M, Rauch SAM. Perceived social support in multi-era veterans with posttraumatic stress disorder. Journal of Nervous and Mental Disease. 2016; 204:317–320. [PubMed: 27015395]

Thoits PA. Stress and health: Major findings and policy implications. Journal of Health and Social Behavior. 2010; 51(Suppl):S41–S53. [PubMed: 20943582]

Thoits PA. Mechanisms linking social ties and support to physical and mental health. Journal of Health and Social Behavior. 2011; 52:145–161. [PubMed: 21673143]

Tsai J, Harpaz-Rotem I, Pietrzak RH, Southwick SM. The role of coping, resilience, and social support in mediating the relation between PTSD and social functioning in veterans returning from Iraq and Afghanistan. Psychiatry. 2012; 75:135–149. [PubMed: 22642433]

Turner RJ, Wheaton B, Lloyd DA. The epidemiology of social stress. American Sociological Review. 1995; 60:104–125.

Weeks WB, Kazis LE, Shen Y, Cong Z, Ren XS, Miller D, Lee A, Perlin JB. Differences in health-related quality of life in rural and urban veterans. American Journal of Public Health. 2004; 94:1762–1767. [PubMed: 15451747]

Wheaton, B., Young, M., Montazer, S., Stuart-Lahman, K. Social stress in the twenty-first century. In: Aneshensel, CS.Phelan, JC., Bireman, A., editors. Handbook of the sociology of mental health. New York, NY: Springer; 2013. p. 299-323.

Yamashita J. A review of psychological assessments for disaster mental health studies. Psychological Trauma. 2012; 4:560–567.

Table 1

Demographic characteristics of Veterans' Health Study ($N = 700$).

Study variables	*n* (%)	95% confidence interval
Age		
18–39	66 (9.43)	7.47–11.83
40–64	415 (59.29)	55.59–62.88
65 or older	219 (31.29)	27.95–34.83
Gender		
Female	29 (4.14)	2.89–5.90
Male	671 (95.86)	94.10–97.11
Race (White)		
No	47 (6.71)	5.08–8.83
Yes	653 (93.29)	91.17–94.92
Married		
No	143 (20.43)	17.60–23.59
Yes	557 (79.57)	76.41–82.40
Some college or higher		
No	301 (43.00)	39.37–46.71
Yes	399 (57.00)	53.29–60.63
Employed full- or part-time		
No	387 (55.29)	55.57–58.94
Yes	313 (44.71)	41.06–48.43
Rural location		
No	358 (51.14)	47.43–54.84
Yes	342 (48.86)	45.16–52.57
Service era		
Vietnam	504 (72.00)	68.55–75.21
Gulf	68 (9.73)	7.73–12.15
Operation Enduring Freedom/Operation Iraqi Freedom	96 (13.71)	11.35–16.47
Other	32 (4.57)	3.25–6.40
Multiple warzone tours		
No	500 (71.43)	67.96–74.66
Yes	200 (28.57)	25.34–32.04
High combat exposure		
No	551 (78.86)	75.67–81.73
Yes	148 (21.14)	18.27–24.33
Branch		
Air Force	149 (21.29)	18.40–24.48
Army	388 (55.43)	51.71–59.08
Navy	74 (10.57)	8.50–13.08
Marines	84 (12.00)	9.79–14.63
Other	5 (0.71)	0.30–1.71

Table 2

Social and psychological characteristics of Veterans' Health Study ($N = 700$).

Study variables	*N* (%)	95% confidence interval
High childhood abuse/neglect score		
No	567 (81.00)	77.91–83.74
Yes	133 (19.00)	16.26–22.09
Low self-esteem		
No	505 (72.14)	68.70–75.35
Yes	195 (27.86)	24.65–31.30
Low psychological resilience		
No	551 (78.71)	75.52–81.60
Yes	149 (21.29)	18.40–24.48
High current level of social support		
No	155 (22.15)	19.21–25.38
Yes	545 (77.86)	74.62–80.79
High help-seeking support since deployment		
No	498 (71.14)	67.67–74.39
Yes	202 (28.86)	25.61–32.33
High social capital		
No	245 (35.00)	31.55–38.62
Yes	455 (65.00)	61.38–68.45
High other mental support since deployment		
No	597 (85.29)	83.46–87.73
Yes	103 (14.71)	12.27–17.54
Psychotropic medications past year		
No	556 (79.43)	76.26–82.27
Yes	144 (20.57)	20.57–23.74
Lifetime posttraumatic stress disorder		
No	633 (90.43)	88.01–92.40
Yes	67 (9.57)	7.60–11.99
Lifetime major depressive disorder		
No	571 (81.57)	78.52–84.28
Yes	129 (18.43)	15.72–21.48
Lifetime suicide ideation		
No	618 (88.29)	85.68–90.47
Yes	82 (11.71)	9.53–14.32
Alcohol misuse (CAGE Scale)		
No	613 (87.57)	84.91–89.82
Yes	87 (12.43)	10.18–15.09
Lifetime Mental Health Service Use		
No	349 (50.00)	46.15–53.56
Yes	351 (50.00)	46.44–53.85

Study variables	*N* (%)	95% confidence interval
Lifetime Veterans Affairs service use		
No	346 (49.43)	45.73–53.14
Yes	354 (50.57)	46.86–54.27

Table 3

Social support and psychological functioning in Veterans' Health Study ($N = 700$).

Psychological functioning variables	High social support			High help-seeking			High social capital			High other mental support			High rural location		
	no *n* (%)	yes *n* (%)	χ^2 (*p*-value)	no *n* (%)	yes *n* (%)	χ^2 (*p*-value)	no *n* (%)	yes *n* (%)	χ^2 (*p*-value)	no *n* (%)	yes *n* (%)	χ^2 (*p*-value)	no *n* (%)	yes *n* (%)	χ^2 (*p*-value)
Lifetime posttraumatic stress disorder	35 (11.11)	32 (8.31)	1.57 (0.211)	33 (6.63)	34 (16.83)	17.29 (<0.001)	27 (11.02)	40 (8.79)	0.91 (0.340)	51 (8.54)	16 (9.57)	4.96 (0.026)	29 (8.10)	38 (11.11)	1.83 (0.177)
Lifetime major depressive disorder	77 (24.44)	52 (13.51)	13.79 (<0.001)	66 (13.25)	63 (31.19)	30.75 (<0.001)	53 (21.63)	76 (16.70)	2.57 (0.109)	100 (16.75)	29 (28.16)	7.60 (0.006)	70 (19.55)	59 (17.25)	0.62 (0.433)
Lifetime suicide ideation	52 (16.51)	30 (7.79)	12.73 (<0.001)	40 (8.03)	42 (20.79)	22.62 (<0.001)	37 (15.10)	45 (9.89)	4.18 (0.041)	60 (10.05)	22 (21.36)	10.86 (0.001)	39 (10.89)	43 (12.57)	0.48 (0.490)
Alcohol misuse past year	47 (14.92)	40 (10.39)	3.27 (0.071)	55 (11.04)	32 (15.84)	3.04 (0.082)	40 (16.33)	47 (10.33)	5.26 (0.022)	69 (11.56)	18 (17.48)	2.83 (0.093)	52 (14.53)	35 (10.23)	2.95 (0.086)
Lifetime mental health service use	181 (57.46)	170 (44.16)	12.27 (<0.001)	214 (42.97)	137 (67.82)	35.50 (<0.001)	134 (54.69)	217 (47.69)	3.12 (0.078)	266 (44.56)	85 (82.52)	50.65 (<0.001)	188 (52.51)	163 (47.66)	1.65 (0.200)
Lifetime Veterans Affairs service use	264 (48.44)	281 (51.56)	0.96 (0.328)	82 (40.59)	120 (59.41)	8.87 (0.003)	227 (49.43)	228 (50.11)	0.11 (0.740)	46 (44.66)	57 (55.34)	11.15 (0.001)	173 (50.58)	169 (49.42)	0.36 (0.550)

Table 4

Logistic regression odds ratio (OR) and 95% confidence interval (CI) for variables predicting social support and coping since deployment in Veterans' Health Study (N = 700).

	Social support			Help-seeking since deployment		
Predictor variables	**OR**	**(95% CI)**	***p*-value**	**OR**	**(95% CI)**	***p*-value**
Age (years)	0.99	(0.96–1.03)	0.669	0.99	(0.96–1.02)	0.663
Marital status (married)	3.59	(2.27–5.68)	<0.001	0.55	(0.36–0.84)	0.006
Education (some college +)	0.95	(0.63–1.44)	0.817	0.97	(0.69–1.39)	0.891
Employment status (employed)	0.77	(0.49–1.21)	0.259	1.01	(0.69–1.49)	0.945
Vietnam veteran (yes)	1.29	(0.62–2.67)	0.500	0.99	(0.51–1.91)	0.981
Operation Enduring Freedom/Operation Iraqi Freedom veteran (yes)	1.41	(0.57–3.49)	0.458	1.04	(0.49–2.23)	0.918
Multiple combat tours (yes)	1.35	(0.86–2.13)	0.195	0.83	(0.56–1.22)	0.348
Combat exposure (high)	1.23	(0.74–2.06)	0.424	1.79	(1.19–2.70)	0.005
History childhood adversities (high)	0.74	(0.45–1.21)	0.234	1.42	(0.93–2.18)	0.108
Self-esteem (low)	0.25	(0.16–0.39)	<0.001	1.41	(0.93–2.14)	0.103
Psychological resilience (low)	0.57	(0.36–0.92)	0.022	1.36	(0.87–2.11)	0.170
Help-seeking since deployment (high)	3.43	(2.05–5.72)	<0.001		—	
Social support (high)		—		3.58	(2.14–5.98)	<0.001
Rural location (high)	2.07	(1.36–3.08)	0.001	0.60	(0.42–0.85)	0.004

Mil Behav Health. Author manuscript; available in PMC 2017 October 31.

Table 5

Logistic regression odds ratio (OR) and 95% confidence interval (CI) for variables predicting mental health outcomes among participants in Veterans' Health Study (N = 700).

	Lifetime PTSD		Lifetime depression		Lifetime suicide ideation		Alcohol misuse past year		Lifetime mental health service use		Lifetime Veterans Affairs service use	
Predictor variables	**OR**	**95% CI *p*-value**	**OR**	**(95% CI) *p*-value**	**OR**	**95% CI *p*-value**	**OR**	**(95% CI) *p*-value**	**OR**	**95% CI *p*-value**	**OR**	**95% CI *p*-value**
Age (years)	0.95	(0.89–1.00) 0.065	**0.93**	**(0.89–0.97) 0.001**	0.98	(0.93–1.03) 0.429	0.96	(0.92–1.00 0.058	**0.95**	**(0.92–0.98) 0.001**	1.00	(0.98–1.03) 0.860
Marital status (married)	0.54	(0.29–1.02) 0.058	0.78	(0.47–1.30) 0.347	0.85	(0.46–1.59) 0.618	0.75	(0.43–1.31) 0.306	0.63	(0.43–1.02) 0.062	1.15	(0.77–1.70) 0.494
Education (some college +)	1.37	(0.75–2.48) 0.306	0.92	(0.59–1.46) 0.735	1.00	(0.58–1.73) 0.999	1.39	(0.85–2.29) 0.193)	**1.57**	**(1.11–2.22) 0.010**	1.03	(0.75–1.41) 0.851
Employment status (employed)	0.98	(0.53–1.84) 0.961	0.75	(0.46–1.22) 0.251	0.95	(0.52–1.73) 0.871	**1.92**	**(1.14–3.23) 0.014**	1.05	(0.72–1.52) 0.812	0.78	(0.55–1.10) 0.151
Vietnam veteran (yes)	**5.55**	**(1.25–24.65) 0.024**	2.42	(0.92–6.39) 0.073	1.10	(0.40–3.04 0.858	1.55	(0.58–4.15) 0.384	1.55	(0.82–2.95) 0.176	0.77	(0.44–1.35) 0.361
Operation Enduring Freedom/ Operation Iraqi Freedom veteran (yes)	1.32	(0.37–4.75) 0.666	**0.34**	**(0.12–0.91) 0.031**	**0.21**	**(0.06–0.73) 0.015**	0.72	(0.29–1.82) 0.487	**0.44**	**(0.20–0.96) 0.040**	1.31	(0.66–2.61) 0.434
Multiple combat tours (yes)	**2.12**	**(1.17–3.85) 0.014**	1.55	(0.92–2.50) 0.076	1.27	(0.70–2.29) 0.429	0.85	(0.50–1.43) 0.525	0.90	(0.62–1.32) 0.609	1.15	(0.81–1.62) 0.441
Combat exposure (high)	1.74	(0.95–3.21) 0.074	0.90	(0.53–1.52) 0.685	0.69	(0.35–1.32) 0.259	1.21	(0.69–2.10) 0.504	**1.64**	**(1.07–2.53) 0.023**	**1.87**	**(1.26–2.78) 0.003**
History of childhood adversity (high)	**3.27**	**(1.81–5.90) <0.001**	**2.41**	**(1.49–3.90) <0.001**	**2.67**	**(1.53–4.67) 0.001**	0.66	(0.35–1.24) 0.194	**1.96**	**(1.25–3.06) 0.003**	1.00	(0.68–1.49) 0.981
Self–esteem (low)	1.17	(0.61–2.29) 0.626	**2.13**	**(1.31–3.47) 0.002**	**2.81**	**(1.57–5.02) 0.001**	1.63	(0.95–2.79) 0.078	**2.10**	**(1.40–3.16) <0.001**	1.08	(0.74–1.57) 0.689
Psychological resilience (low)	**4.28**	**(2.28–8.03) <0.001**	**3.36**	**(2.07–5.44) <0.001**	**4.58**	**(2.60–8.09) <0.001**	1.51	(0.87–2.65) 0.145	**3.14**	**(1.97–5.01) <0.001**	1.31	(0.87–1.97) 0.193
Help–seeking since deployment (high)	**2.48**	**(1.36–4.49) 0.003**	**3.26**	**(2.03–5.23) <0.001**	**3.52**	**(1.99–6.24) <0.001**	1.30	(0.78–2.16) 0.318	**2.61**	**(1.78–3.84) <0.001**	**1.49**	**(1.05–2.10) 0.026**
Social support (high)	0.97	(0.47–2.00) 0.931	**0.54**	**(0.32–0.93) 0.025**	0.72	(0.38–1.38) 0.326	1.00	(0.55–1.81) 0.999	0.85	(0.55–1.32) 0.473	1.17	(0.78–1.30) 0.450
Rural location (high)	**2.18**	**(1.21–2.23) 0.010**	1.05	(0.67–1.65 0.820	1.49	(0.87–2.57) 0.149	0.67	(0.42–1.09) 0.109	0.96	(0.68–1.35) 0.813	0.95	(0.70–1.30) 0.754

Note. Bold numbers indicate significance at $p < 0.05$ or less.