Published in final edited form as:

Mil Behav Health. 2015 ; 3(4): 316–327. doi:10.1080/21635781.2015.1093981.

Suicide Attempt Characteristics Among Veterans and Active-Duty Service Members Receiving Mental Health Services: A Pooled Data Analysis

Jennifer L. Villatte,

University of Washington, Seattle, Washington

Stephen S. O'Connor,

Western Kentucky University, Bowling Green, Kentucky

Rebecca Leitner,

Rocky Mountain Mental Illness Research, Education and Clinical Center, Denver VA Medical Center, Denver, Colorado

Amanda H. Kerbrat,

University of Washington, Seattle, Washington

Lora L. Johnson, and

Robley Rex VA Medical Center, Louisville, Kentucky

Peter M. Gutierrez

Rocky Mountain Mental Illness Research, Education and Clinical Center, Denver VA Medical Center, and University of Colorado School of Medicine, Denver, Colorado

Abstract

Past suicidal behaviors are among the strongest and most consistent predictors of eventual suicide and may be particularly salient in military suicide. The current study compared characteristics of suicide attempts in veterans ($N = 746$) and active-duty service members ($N = 1,013$) receiving treatment for acute suicide risk. Baseline data from six randomized controlled trials were pooled and analyzed using robust regression. Service members had greater odds of having attempted suicide relative to veterans, though there were no differences in number of attempts made. Service members also had higher rates of premilitary suicide attempts and nonsuicidal self-injury (NSSI). Veterans disproportionately attempted suicide by means of overdose. In veterans, combat deployment was associated with lower odds of lifetime suicide attempt, while history of NSSI was associated with greater attempt odds. Neither was significantly associated with lifetime suicide attempt in service members. Implications for suicide assessment and treatment are discussed.

Thousands of studies have been conducted over the past 40-plus years attempting to characterize suicide risk and protective factors in an effort to improve prevention efforts. The bulk of this research both in the United States and internationally has involved civilian

participants. That may be partly due to the fact that, until recently, serving in the military appeared to be protective against suicide (Berman et al., 2010; Nock et al., 2014). Historically, suicide rates among U.S. service members were roughly half those of their civilian counterparts (Eaton, Messer, Garvey Wilson, & Hoge, 2006; Kessler et al., 2013), but the military suicide rate has been climbing. In 2008 the rate of suicide in Army personnel exceeded that of demographically matched civilians for the first time (Kuehn, 2009; Nock et al., 2014). Suicide rates among U.S. veterans are also higher and climbing faster than in the U.S. general population, and this trend may be worse among women. Between 2001 and 2010 male veteran suicides increased by 15%, while suicide among female veterans increased by 35% (Kemp & Bossarte, 2013).

Preventing military suicide is a top priority, and together the U.S. Departments of Defense (DoD) and Veterans Affairs (VA) fund almost one-quarter of all U.S. suicide studies, accounting for 53% of federal dollars spent on suicide research (NAASP, 2015). The DoD has focused efforts on suicide surveillance using the DoD Suicide Event Report (DoDSER) system, an event-based epidemiological data collection system developed to examine the circumstances of suicide behaviors among service members (Bush et al., 2013). The VA is also improving suicide surveillance by integrating information from the National Death Index, state mortality records, Suicide Behavior Reports, Veterans Crisis Line, and the VA's universal electronic medical records (Kemp & Bossarte, 2013).

The military has also bolstered efforts to understand characteristics of suicidal behavior among military personnel to better identify those at risk and improve suicide prevention efforts. Large epidemiological studies like the Millennium Cohort Study (Gray et al., 2002) and Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS; Ursano et al., 2014) are in progress and have begun to elucidate the problem of military suicide at the population level. Thus far, military variables (e.g., combat deployment and associated stressors) have shown low associations with suicidal ideation and behaviors (Bryan et al., 2015; Griffith, 2012). A number of suicide risk factors have been identified from these studies (Nock et al., 2013), but many are not unique to military suicide (e.g., presence of mental illness, stressful life events, hopelessness) or are so characteristic of the military that they have minimal use in detecting risk (e.g., men, ages 17 to 29, access to lethal means). Relatively few studies have examined the role of historical variables that elevate suicide risk, despite evidence that these confer greater risk for suicidal thoughts and behaviors among service members and veterans (Bryan, Bryan, Ray-Sannerud, Etienne, & Morrow, 2014; Griffith, 2012).

Past suicidal behaviors are among the strongest and most consistent predictors of eventual suicide, and previous attempts are associated with more severe suicidal ideation among service members (Joiner et al., 2005). An understanding of how and when previous suicide attempts occurred could lead to more effective strategies for identifying and treating service members and veterans who are most vulnerable to suicidal thoughts and behaviors (Bryan et al., 2014). While there is extensive research comparing self-injurious thoughts and behaviors among military personnel to the general population, data directly comparing suicide behaviors in active-duty service members and veterans are scant (see Bossarte et al., 2012). Additional research is needed to understand characteristics of suicide that are specific to

service members and to veterans, because assessment and intervention strategies for these two groups are implemented in different health care systems. It is not known whether or how suicide characteristics differ, or if intervention strategies based on such knowledge will generalize across the Military Health System (MHS) and Veterans Health Administration (VHA).

The current study sought to characterize nonfatal suicide attempts in a sample of 1,759 service members and veterans across the armed services receiving treatment at either MHS or VHA clinics due to concerns about suicide risk. We sought to answer three primary research questions. First, what proportion of active-duty service members versus veterans in suicide-related treatment has ever attempted suicide? Second, do timing, method, and lethality of nonfatal suicide attempts differ between service members and veterans? And finally, are there differences between service members and veterans in terms of demographic and military variables associated with attempted suicide?

METHOD

Sample of Studies

This report presents an analysis of pooled baseline data from six randomized controlled trials examining suicide interventions in active-duty and veteran military personnel. Data were collected between 2010 and 2015. The primary inclusion criteria across four studies (Bryan, 2013; Comtois, 2013; Jobes, 2011; Johnson, O'Connor, Kaminer, Jobes, & Gutierrez, 2014) were current suicidal ideation and/or a lifetime suicide attempt. Two studies (Gutierrez, 2009; Luxton, 2011) did not recruit based on suicidality but on recent discharge from inpatient psychiatric hospitalization, outpatient mental health, or substance abuse treatment. For these studies, we selected only participants with a lifetime suicide attempt and/or current suicidal ideation for inclusion in the pooled data analyses. Common exclusion criteria across studies were inability to speak and understand English, psychiatric or medical condition severe enough to preclude consent, and judicially ordered or involuntary treatment. Detailed descriptions of sample characteristics can be found in the introduction to the upcoming issue's special section (Gutierrez, in press). All studies were approved by appropriate military, VA, and university institutional review boards (IRBs) prior to enrollment, and all relevant IRBs approved pooling of data for the purposes of secondary data analyses. Deidentified, individual, item-level data were pooled into a single data set containing 1,759 cases.

Instruments

The current analyses examined demographic (i.e., sex, race, ethnicity), military (i.e., service branch, combat deployment, military service years), and nonsuicidal self-injury (NSSI) variables as correlates of nonfatal suicide attempt in service members and veterans. Prevalence and characteristics of suicide attempt (i.e., premilitary, during active service, following separation, method of injury) were assessed via two standardized clinical interviews. The Suicide Attempt and Self-Injury Count (Linehan, Comtois, Brown, Heard, & Wagner, 2006) is a semistructured interview that assesses lifetime acts of self-directed violence, method of injury, suicide intent, lethality of attempt, and medical treatment

received. It has demonstrated excellent interrater reliability (ICCs .871 to .978) and validity compared to medical records, therapist notes, and patient self-monitoring. The Self-Harm Behavior Questionnaire (SHBQ; Gutierrez, Osman, Barrios, & Kopper, 2001) is a semistructured interview that assesses lifetime instances of self-directed violence, suicidal intent, suicide threats, and suicide ideation, as well as method of injury and need for medical attention. Good internal consistency ($.96 > \alpha > .89$) was demonstrated in the original validation study. In the current study, suicide attempt was defined as an act of self-directed violence with either clear or ambivalent intent to die. Acts of self-directed violence with no intent to die were categorized as NSSI.

A subset of the sample ($n = 887$) was assessed for lethality per instance of attempted suicide. Lethality was rated using a behaviorally anchored rating scale indicating medical risk of death, with minimum value of 1 (e.g., ingesting 5 or fewer pills of a medication not lethal in small doses) and maximum value of 6 (e.g., pulling trigger of loaded gun aimed at vital area).

Data Analysis

Logistic regression was used to compare the odds of having a lifetime suicide attempt, premilitary suicide attempt, and suicide attempt by various methods of self-directed violence among veterans and service members receiving suicide-related treatment. Since the modal number of suicide attempts was zero, a negative binomial regression was used to model number of suicide attempts. Multivariate logistic regression was used to compare demographic, military, and clinical correlates of lifetime suicide attempt among veterans and service members. We applied a Bonferroni correction for inflated family-wise error in this final model due to the seven separate interaction terms included in the analysis. All regression models accounted for effects of sex, race, and ethnicity and employed robust standard error estimators that are consistent under heteroscedasticity. Though data were drawn from six different study samples, we assumed that all sampled from the population of interest (i.e., veterans and service members receiving suicide-related treatment); therefore, a nested design was not employed.

Results

Table 1 reports participant demographic and military characteristics. Descriptive suicide behavior data is reported in Table 2.

History of suicide attempt—Approximately half of all participants reported at least one suicide attempt in their lifetimes. Service members had a 24% greater odds of having attempted suicide than veterans (OR = 1.24, 95% CI: 1.02, 1.51), accounting for the effects of sex, race, and ethnicity. No other variables in the model were significantly related to having made a lifetime suicide attempt. Among those who attempted suicide, veterans made a greater number of attempts per individual, but this difference was not statistically significant in negative binomial regression analysis.

Timing of first suicide attempt—The majority of first attempts by veterans typically occurred after military separation, with only 22% occurring prior to military enrollment and

21% occurring during active service. The majority of first attempts among service members occurred during active service, though 40% reported a premilitary suicide attempt. The odds of having attempted suicide prior to joining the military were 51% greater for service members relative to veterans (OR = 1.51, 95% CI: 1.10, 2.06) when accounting for effects of sex, race, and ethnicity. Sex was an independent predictor of premilitary suicide; the odds of having attempted suicide prior to joining the military were two times greater for women than for men (OR = 2.15, 95% CI: 1.56, 2.97).

Method of suicide attempt—Figure 1 represents the relative odds of having used specific suicide attempt methods by veterans and service members. Relative to veterans, service members had greater odds of self-cutting (OR = 2.13, 95% CI: 1.65, 2.76), burning (OR = 1.94, 95% CI: 1.24, 3.02), hanging or strangling (OR = 1.70, 95% CI: 1.19, 2.44), headbanging or hitting themselves with an object (OR = 1.55, 95% CI: 1.08, 2.22), or some other less common method of attempting suicide (OR = .673, 95% CI: .460, .985). The odds of intentionally overdosing on drugs, medicine, or alcohol were 47% greater for veterans than for active-duty service members (OR = .525, 95% CI: .409, .673). No significant differences were observed between veterans and service members in probability of attempting suicide by jumping from a height, gunshot, poisoning, asphyxiation or strangling, attempted drowning, or stabbing.

Sex was an independent predictor of engaging in certain methods of suicide attempt. Women in this sample had greater odds of attempt by cutting (OR = 1.72, 95% CI: 1.28, 2.31) and overdosing (OR = 2.17, 95% CI: 1.62, 2.90) relative to men. Men had greater odds of hanging or strangling (OR = .563, 95% CI: .360, .880), gunshot (OR = .389, 95% CI: .171, .887), or some less common method of attempting suicide (OR = .673, 95% CI: .460, .985).

Some racial or ethnic minority groups had significantly different odds of engaging in certain suicide attempt methods relative to Caucasians. African Americans had lower odds of self-cutting (OR = .479, 95% CI: .328, .701) or stabbing (OR = .174, 95% CI: .042, .718) but greater odds of self-poisoning (OR = 2.59, 95% CI: 1.23, 5.45). Participants with mixed racial identities had greater odds of jumping from a height (OR = 3.05, 95% CI: 1.38, 6.78) and headbanging (OR = 1.73, 95% CI: 1.00, 2.99). American Indians/Alaskan Natives had greater odds of self-poisoning (OR = 12.19, 95% CI: 3.61, 41.22). Participants reporting Hispanic ethnicity had greater odds of overdosing (OR = 1.43, 95% CI: 1.02, 2.02) and lower odds of self-stabbing (OR = .284, 95% CI: .087, .931) than non-Hispanics.

Lethality of suicide attempts—Across the subsample for which it was available, suicide attempt lethality spanned the full range of possible values and was normally distributed ($M = 3.47$, $SD. = 1.5$). Veterans were more likely than service members to engage in more lethal suicide attempts ($B = -.303$, 95% CI: $-.516$, $-.090$) when accounting for effects of sex, race, and ethnicity. Men, regardless of active or veteran status, were more likely to engage in more lethal attempts than women ($B = -2.53$, 95% CI: $-.475$, $-.030$). Race and ethnicity were not significantly associated with lethality of suicide attempts.

Factors associated with suicide attempt—Multiple regression analysis revealed no main effects for demographic or military variables associated with lifetime suicide attempt, but two significant interactions were observed. A summary of these results can be seen in Table 3. Veterans who had been deployed to combat had significantly lower odds of having attempted suicide relative to veterans with no combat deployments. Service members deployed to combat had slightly greater odds of suicide attempt relative to service members who had not been deployed, but this relationship was not statistically significant. A significant interaction was also observed between service status and lifetime history of NSSI predicting attempt odds. Among service members, odds of having made a suicide attempt were not significantly affected by having engaged in NSSI. In contrast, the odds of a suicide attempt were 3.6 times higher for veterans who had a history of NSSI relative to veterans who did not.

DISCUSSION

Suicide ideation, planning, and behavior are robust risk factors for suicide death and often precipitate mental health service connection for service members and veterans. Thus, understanding characteristics of attempted suicide can be an effective step toward improving the assessment and treatment of suicidality in these groups. The current study sought to understand the context and characteristics of non-fatal suicide attempts in a pooled sample of 1,759 service members and veterans enrolled in suicide intervention studies within the DoD and VA. In so doing, we hope to highlight similarities and differences between the two groups and potentially spark ideas for researchers, clinicians, and policymakers addressing the significant public health problem of service member and veteran suicide.

Veterans and Service Members Differed in Nonfatal Suicide Attempt Characteristics

The proportion of service members and veterans in treatment for suicide risk that report a nonfatal suicide attempt does not appear strikingly different (51% and 46%, respectively), but service members had 24% greater odds of having attempted suicide. When interpreting these findings, it is important to remember that service members and veterans who died by suicide are not represented in this study. This may partially explain the finding that the average number of lifetime attempts was equivalent between service members and veterans, even though veterans had more years of lived experience and thus more opportunity to attempt and complete suicide. It is possible that the veterans who survived and made it into the source studies were more resilient or had more successful interventions over the years and therefore were less likely to have attempted suicide in spite of suicidal distress. Another possible explanation is that the nature of military service has changed such that current service members are at increased risk of attempting suicide (Nock et al., 2014; Schoenbaum et al., 2014), whereas veterans of previous periods of service benefited from the generally protective nature of military service (Gallaway et al., 2013). Longitudinal research into the situational risk factors associated with military service and retirement, and how they change over time, is recommended.

Timing of first attempt—The majority of first attempts among veterans occurred after military separation, while most first attempts among service members occurred during

military service, even though the active service period is not yet complete in this group. Servicemembers also had 51% greater odds of attempting suicide prior to military enrollment. This finding is particularly concerning in light of recent evidence that premilitary suicide attempts remain a significant predictor of later suicide attempts in service members and veterans, even when controlling for the effects of demographic variables, psychological distress, suicide plans, and NSSI (Bryan et al., 2014). Though the rate of premilitary suicide attempt observed in this study is considerably higher than in recent reports of prevalence in new soldiers (Ursano et al., 2015), as well as in military personnel receiving outpatient mental health treatment, it is consistent with the latter study's estimates that at least half of service members and veterans who engage in suicidal behaviors have a history of premilitary suicide ideation or self-directed violence (Bryan et al., 2014).

Methods of nonfatal suicide attempt—Veterans had 47% greater odds than service members of attempting suicide by overdosing on medications, drugs, or alcohol. It is possible that veterans more often selected some means of overdose due to easier access to prescription medications, alcohol, and illicit drugs than active-duty service members, though additional factors likely play a role. For example, veterans are more likely to have chronic pain and long-term health conditions requiring polypharmacy (Im et al., 2015), conferring both additional suicide risk and increased access to suicide means. Veterans are also more likely to be socially isolated and use alcohol and drugs in contexts where an overdose may not be detected (Dittrich et al., 2015). Illicit drugs and alcohol might be used very socially in the military setting, and service members may have fewer opportunities to overdose without being discovered by others. Those who wish to die may choose a “quicker” means with less likelihood of being interrupted.

Though firearms are the most common means of suicide in the United States (Xu, Kochanek, Murphy, & Arias, 2014), including among service members and veterans, this highly lethal method is naturally less common in a sample of suicide attempt survivors. Service members had greater odds of using suicide methods associated with both greater (e.g., hanging, burning, or immolation) and lesser risk of death (e.g., cutting, headbanging). Some level of suicide intent was recorded in each of these instances, so this finding may reflect greater ambivalence about wanting to die. The disproportionate number of nonfatal suicide attempts using relatively lethal means may also indicate a greater likelihood of service members being interrupted during a suicide attempt. This hypothesis is consistent with the 2013 DoDSER report that 40% of service member suicide attempts were observable to others and 71% occurred at the service member's permanent duty station (Smolenski et al., 2014).

The observed gender differences in methods of nonfatal suicide attempt are in keeping with general population findings, where men tend to select more violent means (Andover, Primack, Gibb, & Pepper, 2010; Brown, Comtois, & Linehan, 2002). However, it is important to note that rates of firearm suicide increased disproportionately among female veterans from 2001 to 2010, which may point to an important change in preference for more lethal means that deserves further study (McCarten, Hoffmire, & Bossarte, 2015). We do not know enough from the extant literature about racial and ethnic differences in suicide attempt methods (Eaton et al., 2006) to determine whether our findings are consistent with what is

seen in civilians. Though the very large odds of American Indian/Alaskan Native (AI/ AN) participants self-poisoning is striking, this result should be interpreted with caution, because poisoning was a rare event and those identifying as AI/AN represented only 4% of the total sample.

Lethality—The violence associated with a chosen means does not necessarily line up with the lethality of a suicide attempt, which is also influenced by situational factors that contribute to risk of fatality. Veterans had significantly greater odds of making a more lethal suicide attempt than service members. This was partially due to the increased likelihood of attempting suicide while intoxicated, which confers greater medical risk of death, and low potential for being interrupted. Age may also be a factor in the higher lethality observed among veterans. Generally speaking, as people get older and gain more experience with self-directed violence they select methods with greater potential lethality (Alexopoulos et al., 2009; Bhar & Brown, 2012; Eddleston, Dissanayake, Sheriff, Warrell, & Gunnel, 2006). As Joiner's (2005) interpersonal psychological theory proposes, the capability for suicide is acquired through repeated exposure to painful and life-threatening experiences, and it takes time for people to habituate to the pain associated with increasingly lethal self-injury. So it is possible that the active-duty participants have yet to develop high enough levels of acquired capability to engage in more lethal self-directed violence. Our finding does not support more recent theorizing about the primary role of acquired suicide in military suicide (Selby et al., 2010), but the current study was not specifically designed to test Joiner's (2005) theory, so we offer this interpretation tentatively and recommend additional research.

Factors Associated With Suicide Differed Among Service Members and Veterans

It is well established in the literature that NSSI confers significant risk of suicide for soldiers (Nock et al., 2013), veterans (Bryan et al., 2014), and civilians (Joiner, Ribeiro, & Silva, 2012). However, a surprising interaction between service status, NSSI, and suicide attempt was observed in this study. Consistent with existing literature, veterans with a lifetime history of NSSI were significantly more likely to have made a suicide attempt than those with no instances of NSSI. In contrast, NSSI was not associated with suicide attempt among service members, even though the proportion of service members who had engaged in NSSI was twice the proportion observed in veterans. It is possible that the greater incidence of NSSI in service members reflects a generational shift in the prevalence and function of NSSI (Klonsky, 2011), diluting its historical association with suicide attempt. It is also possible that veterans had more years to acquire suicide capability through repeated instances of NSSI than the typically younger service members. We cannot make inferences about causality because the nature of our data does not allow for testing the temporal sequence of events. However, these results highlight the need for prospective, longitudinal research to better understand the interaction between military service, NSSI, and suicide attempts.

Much has been made in the popular press about the likely connections between combat deployments and suicide risk, with the assumption being that combat deployment increases the risk for suicide. However, the scientific literature has yet to demonstrate clear evidence of this relationship. The Millennium Cohort Study, a prospective epidemiological study with more than 200,000 randomly selected U.S. military service members from all service

branches, found no evidence that deployment was associated with suicide and that those deployed to the current operations were no more likely to have a suicide death than those who did not deploy (LeardMann et al., 2013). A recent study looking specifically at those serving in Operation Enduring Freedom or Operation Iraqi Freedom also did not find an association between deployment and rates of suicide (Reger et al., 2015). Whereas findings from an epidemiological study focusing on the U.S. Army found an association between deployment and risk of suicide attempt (Nock et al., 2014) and suicide (Schoenbaum et al., 2014). In our pooled sample, active combat deployment was associated with slightly increased odds of a lifetime suicide attempt in service members, though this finding was not statistically significant. However, a history of combat deployment was associated with significantly *lower* odds of having attempted suicide among veterans. It is possible that combat deployment in previous conflicts may be linked to the historically protective effect of military service on suicide. It is also possible that veterans who have survived suicidal thoughts and behaviors, like those in this study, are impacted differently by combat deployment than veterans who have died by suicide. Further research is needed to understand the complex relationship between combat deployment and suicidal behaviors in veterans, as existing data are inconclusive.

Clinical Implications and Suggestions for Further Research

Epidemiological studies consistently find history of suicidal behavior to be one of the strongest risk factors for eventual death by suicide (Borges et al., 2006; Borges et al., 2010), and yet it is widely accepted that nonfatal suicide attempts are substantially underreported (Crosby, Han, Ortega, Parks, & Gfroerer, 2011). This means that one of the best ways to identify those at risk and intervene prior to a suicidal crisis has limited utility as a screening and prevention tool. This problem is reflected in our finding that over half of the service members and veterans in our sample attempted suicide and many of those attempts occurred prior to or during military service. Underreporting may be more prevalent in active duty service members, because past suicidal behavior is a disqualifying condition for military enrollment and many service members fear that disclosure will negatively impact their military careers (e.g., security clearance). This is supported by our finding that 34% of service members reported a history of NSSI and 51% reported a previous suicide attempt, while prior self-injury is reported in only 28% of suicide attempts and 10% suicide deaths in the 2013 DoD SER annual report (Smolenski et al., 2014). Clinicians, commanding officers, and policymakers need to work in concert so that acknowledgment and treatment of suicidal thoughts and behaviors become an accepted, effective solution that meets the needs of both the military and its current and former personnel.

Our finding that service members have disproportionately higher incidence of premilitary suicide attempts has important implications for clinicians assessing and treating military personnel. When assessing suicide risk, historical and dispositional factors are often overlooked in the presence of strong situational factors associated with suicide, as is often the case for military personnel. We recommend clinicians assume that suicidal service members have premilitary vulnerabilities that confer substantial risk for suicide and be attentive to the context and characteristics of possible past suicidal behaviors, as these factors may confer greater risk among military personnel. Given the understandable

reluctance of service members to report previous suicidal behavior, clinicians are encouraged to use strategies that are collaborative (Jobes, 2006) and validating (Rizvi, 2011) to normalize preexisting vulnerabilities and frame them as useful information in developing effective and personalized prevention and treatment plans. We encourage future research to examine the causes and context of underreporting past and present suicidality that may be specific to the military to adapt screening and prevention procedures and maximize the predictive utility of this robust risk factor.

The disproportionate number of service members with a history of NSSI and suicide attempts with minimal potential for lethality suggests there may be complex motivations and ambivalent suicidal intent in this population. Assessment of suicidal ambivalence (i.e., both the wish to die and the wish to live) has successfully predicted future suicidal thoughts and behaviors, response to suicide treatment, and eventual suicide (O'Connor, Jobes, Yeargin, et al., 2012; Brown, Steer, Henriques, & Beck, 2005; O'Connor, Jobes, Comtois, et al., 2012; Lento, Ellis, Hinnant, & Jobes, 2013). We recommend that clinicians assess both reasons to live and reasons to die when calculating suicide risk and throughout treatment in order to monitor progress. The ambivalence rating used in the studies noted here can be easily calculated from the Suicide Status Form used in the evidence-based Collaborative Assessment and Management of Suicide (Jobes, 2006).

Several of the current findings are of interest to clinicians treating veterans with suicidal thoughts and behaviors. Veterans disproportionately attempted suicide by means of intentional overdose and generally made more lethal attempts than service members. Means safety is one of the most effective suicide prevention measures (Yip et al., 2012), though previous research has typically focused on limiting access to firearms. Clinicians are advised to also assess prescription medications, alcohol, and recreational drugs as a potential means of suicide in veterans. Motivational interviewing shows promise in means safety counseling (Britton, Bryan, & Valenstein, 2014), and clinical trials are currently taking place within the VA. Medication blister packs are another promising tool for reducing the likelihood of intentional overdose (Hawton et al., 2004), and one of our source studies is evaluating their use in the VA (Gutierrez, 2009). Because contextual factors contribute to the lethality of suicide attempts, clinicians are also advised to assess factors that influence the likelihood of being interrupted by others (e.g., social isolation) or being capable of intervening on one's own behalf (e.g., intoxication interfering with help seeking).

While the number of previous suicide attempts in this sample is concerning, the fact that 1,759 service members and veterans survived suicidal distress and found their way to suicide treatment is notable. This raises hope that identification and treatment of suicidality in the DoD and VA may increase longevity even if suicidal thoughts and behaviors reoccur. This last point is particularly salient because the unique nature of the military experience typically contributes to elevations in suicide risk, such as overcoming fear of lethal injury, that persist even in the absence of situational risk factors, including those associated with combat deployment and transition to civilian life (Selby et al., 2010). The DoD and VA may be ideal contexts for preventing suicide at a population level. The DoD is uniquely poised to detect suicide risk, due to its rigorous suicide surveillance, the number of persons with dispositional and historical risk factors who join the military, and the situational risk factors

inherent to the military experience (e.g., access to firearms, acquired capability due to repeated exposure to life-threatening events). Likewise, the VA has the capability to implement evidence-based suicide treatment to a large proportion of Americans at risk for suicide. The VHA is the largest health care system in the country, serving 8.76 million veterans per year at more than 1,700 health care sites, and is the largest employer of psychologists and social workers in the country (<http://www.va.gov/health>).

Correlational data suggest recent VA initiatives to reduce mental health stigma, increase health service engagement, and implement evidence-based behavioral health interventions across the VHA system may be having a positive impact on suicidal thoughts and behaviors among veterans. During the period from 1999 to 2010, veterans under age 40 using VHA services had half the suicide rate of those who did not (Kemp, 2014). The protective effect of VHA service utilization is particularly salient for male veterans. In 23 states where data are available to allow comparisons, suicide rates decreased by about 30% in male veteran VHA users, while they increased by about 60% in male veterans who did not use VHA services (Kemp, 2014). Unfortunately, it is estimated that 10% of nonelderly veterans in the United States do not have health insurance and do not use VHA services (Haley & Kenney, 2012). Service members and veterans must access health services for these suicide prevention strategies to work. In addition to clinical trials, we recommend research to improve health service engagement and continuity among U.S. service members and veterans.

A number of promising suicide prevention and treatment interventions have been developed and are currently being evaluated in clinical trials at VA and military installations across the country, including the six source studies used in the current analysis. While targeted treatment is most effective in changing suicidal thoughts and behaviors (Comtois & Linehan, 2006), evidence is mounting that VA implementation of evidence-based psychotherapies for related problems (e.g., depression, sleep disorders) has a positive impact on suicidal ideation. In an analysis of 981 veterans who received acceptance and commitment therapy for depression (ACT-D; Walser, Sears, Chartier, & Karlin, in press) in the VA, a 20.5% reduction in suicide ideation was observed from baseline to follow-up (Walser et al., 2015). Though ACT-D is not specifically a suicide intervention, it does target psychological processes that are theoretically and empirically linked to suicide (Luoma & Villatte, 2012). In the VA rollout of ACT-D, changes in these processes were associated with reductions in suicidal ideation and depression severity and their attenuating effect increased over time (Walser et al., in press). Similarly, a 10% reduction in suicidal ideation from baseline to follow-up was reported in an evaluation of the VA rollout of cognitive behavioral therapy for insomnia (CBT-I; Trockel, Karlin, Taylor, Brown & Manber, 2015).

Study Strengths and Limitations

Data about suicide and individuals affected by suicide are notoriously difficult to obtain for a variety of reasons, including a relatively low incidence rate and reluctance to acknowledge suicidal thoughts, behaviors, and intent (Crosby, Han, et al., 2011). Thus, it is imperative that researchers maximize the use of data from existing studies to strengthen the public health impact of suicide research. The National Action Alliance for Suicide Prevention

(NAASP) (2014) and the National Institute of Mental Health (NIMH) (2015) have both prioritized this objective in their most recent strategic research plans. Two recommended strategies for leveraging suicide research investments (i.e., data sharing and the use of common data elements) were employed in the current study to obtain maximum benefit from the large pooled sample and rigorous, comprehensive baseline assessments in six federally funded suicide randomized controlled trials (RCTs).

However, this is not a true epidemiological study, and the results cannot be interpreted as incidence or prevalence rates because participants are not representative of the entire population of U.S. service members and veterans. Due to the design and intent of the original studies (i.e., RCTs of military suicide interventions), three important groups were necessarily omitted from our sample: those who never reported or received treatment for suicidality in the MHS or VHA, separated military personnel not eligible for VA benefits, and those who died by suicide. Data from these groups are essential to understanding military suicide at a population level and, fortunately, the Millennium Cohort Study and other large-scale epidemiological studies are designed to do just that. However, their exclusion leaves us with a subgroup that is important to study in its own right: service members and veterans who are treated for suicide risk in the MHS and VHA. Findings from this study are relevant to suicide assessment and treatment decisions made by health care providers and administrators, researchers, and policymakers in the DoD and VA.

Almost all active-duty service members receive health services through the MHS, but only 25% of veterans receive their health care through the VHA (National Center for Veterans Analysis and Statistics [NCVAS], 2014), raising the question of whether current results may generalize to veterans not receiving VHA services. Some data suggest they would. Veterans with VHA services have similar suicide rates to the general population of veterans, and suicide outcomes in these two groups are more similar to each other than they are to civilians (NCVAS, 2014).

As with all pooled data analyses, including meta-analyses, generalizability of results is complicated by sampling and instrument heterogeneity. Two of the participating studies (Gutierrez, 2009; Luxton, 2011) used selection criteria that differed from the other four but included baseline measures that allowed us to select a subsample of participants using equivalent inclusion and exclusion criteria across all six studies. We believe it is reasonable to assume, based on the combined sampling procedures from the original and pooled data studies, that the current sample is representative of service members and veterans who receive treatment for suicidal thoughts and/or behaviors in the MHS and VHA systems. Fortunately, most of the participating studies included the common data elements recommended for suicide research (Crosby, Ortega, & Melanson, 2011), so instrument harmonization was required in only one instance. One study (Gutierrez, 2009) used a different measure of suicidal behavior, which has similar psycho-metric properties to the common measure, uses the same measure modality (i.e., semistructured interview), and obtains unprocessed behavior count data that are equivalent to the other studies.

The most significant limitations of this study are the potential confounds inherent to our variables of interest. Veterans are a relatively more heterogeneous group in terms of age and

conflict era than are active service members. Few of the veterans in this study were deployed in recent conflicts, while none of the service members served during the Vietnam or prior conflicts. All of these veterans have transitioned back to living as civilians, while service members have not yet experienced life after military separation. It is not possible to determine whether observed effects are due to service member or veteran status or to variables that cannot be separated from service status, such as age/developmental factors, generational differences, factors specific to current conflicts, and situational factors unique to the military or veteran experience (e.g., deployment conditions, transition to civilian life). Yet we believe there is practical value in examining similarities and differences in these groups. If the characteristics and circumstances of attempted suicide are different in service members and veterans who present to MHS and VHA clinics, assessment and treatment strategies should and can be adjusted accordingly, even if the causes of these differences are not known.

Conclusion

Suicide prevention is complex and multifaceted. It requires good assessment strategies that capture accurate data on risk and protective factors, skilled clinicians able to focus directly on suicide as the problem to be treated, and policies informed by the best available empirical data. We hope our characterization of suicide attempts in active-duty service members and veterans provides some insights on which clinicians, policy-makers, and researchers can build, and contributes to a culture where participation in suicide treatment among current and former military personnel is considered as a mark of resilience, selflessness, and courage.

Acknowledgments

This work was supported in part by the Military Suicide Research Consortium (MSRC), an effort supported by the Office of the Assistant Secretary of Defense for Health Affairs under award W81XWH-10-2-0181; by the Military Operational Medicine Research Program (MOMRP) and the U.S. Army Medical Research and Materiel Command (USAMRMC) Telemedicine and Advanced Technology Research Center (TATRC) under awards W81XWH-11-1-0164 and W81XWH-11-2-0123; and by the Department of Defense under awards W81XWH-10-2-0178 and W81XWH-09-1-0723. The first author's work on this publication was supported by the National Institute of Mental Health (NIMH) under award T32 MH082709. Opinions, interpretations, conclusions, and recommendations are those of the authors and are not necessarily endorsed by the aforementioned funding institutions.

References

- Alexopoulos GS, Reynolds CF, Bruce ML, Katz IR, Raue PJ, Mulsant BH. PROSPECT Group. Reducing suicidal ideation and depression in older primary care patients: 24-month outcomes of the PROSPECT study. *American Journal of Psychiatry*. 2009; 166:882–890. [PubMed: 19528195]
- Andover MS, Primack JM, Gibb BE, Pepper CM. An examination of non-suicidal self-injury in men: Do men differ from women in basic NSSI characteristics? *Archives of Suicide Research*. 2010; 14:79–88. [PubMed: 20112146]
- Berman, A.; Bradley, J.; Carroll, B.; Certain, RG.; Gabrelcik, JC.; Green, R.; Werbel, A. The challenge and the promise: Strengthening the force, preventing suicide, and saving lives: Final Report of the Department of Defense Task Force on the Prevention of Suicide by Members of the Armed Forces. Falls Church, VA: Defense Health Board; 2010.
- Bhar SS, Brown GK. Treatment of depression and suicide in older adults. *Cognitive and Behavioral Practice*. 2012; 19:116–125.

- Britton PC, Bryan CJ, Valenstein M. Motivational Interviewing for Means Restriction Counseling With Patients at Risk for Suicide. *Cognitive and Behavioral Practice*. 2014 Advance online publication. 10.1016/j.cbpra.2014.09.004
- Borges G, Angst J, Nock MK, Ruscio AM, Walters EE, Kessler RC. A risk index for 12-month suicide attempts in the National Comorbidity Survey Replication (NCS-R). *Psychological Medicine*. 2006; 36:1747–1757. [PubMed: 16938149]
- Borges G, Nock MK, Haro Abad JM, Hwang I, Sampson NA, Alonso J, Kessler RC. Twelve-month prevalence of and risk factors for suicide attempts in the WHO World Mental Health surveys. *Journal of Clinical Psychiatry*. 2010; 71:1617–1628. [PubMed: 20816034]
- Bossarte RM, Knox KL, Piegari R, Altieri J, Kemp J, Katz IR. Prevalence and characteristics of suicide ideation and attempts among active military and veteran participants in a national health survey. *American Journal of Public Health*. 2012; 102:S38–S40. [PubMed: 22390598]
- Brown GK, Steer RA, Henriques GR, Beck AT. The internal struggle between the wish to die and the wish to live: A risk factor for suicide. *American Journal of Psychiatry*. 2005; 162:1977–1979. [PubMed: 16199851]
- Brown MZ, Comtois KA, Linehan MM. Reasons for suicide attempts and nonsuicidal self-injury in women with borderline personality disorder. *Journal of Abnormal Psychology*. 2002; 111:198–202. [PubMed: 11866174]
- Bryan, CJ. Brief Interventions for Short-Term Suicide Risk Reduction in military populations. *ClinicalTrials.gov*. 2013. List of clinical trials Retrieved from <https://clinicaltrials.gov/ct2/show/NCT02042131?term=craig+bryan+brief+suicide&rank=1>
- Bryan CJ, Bryan AO, Ray-Sannerud BN, Etienne N, Morrow CE. Suicide attempts before joining the military increase risk for suicide attempts and severity of suicidal ideation among military personnel and veterans. *Comprehensive Psychiatry*. 2014; 55:534–541. [PubMed: 24246604]
- Bryan CJ, Griffith JH, Pace BT, Hinkson K, Bryan AO, Clemans TA, Imel ZE. Combat exposure and risk for suicidal thoughts and behaviors among military personnel and veterans: A systematic review and meta-analysis. *Suicide and Life-Threatening Behavior*. 2015 Advance online publication. 10.1111/sltb.12163
- Bush NE, Reger MA, Luxton DD, Skopp NA, Kinn J, Smolenski D, Gahm GA. Suicides and suicide attempts in the U.S. military, 2008–2010. *Suicide and Life Threatening Behavior*. 2013; 43(3): 262–273. [PubMed: 23330611]
- Comtois, KA. Military Continuity Project. *ClinicalTrials.gov*. 2013. List of clinical trials Retrieved from <https://clinicaltrials.gov/ct2/show/study/NCT01829620?term=comtois&rank=1>
- Comtois KA, Linehan MM. Psychosocial treatments of suicidal behaviors: A practice-friendly review. *Journal of Clinical Psychology*. 2006; 62(2):161–170. [PubMed: 16342292]
- Crosby AE, Han B, Ortega LAG, Parks SE, Gfroerer J. Suicidal thoughts and behaviors among adults aged 18 years—United States, 2008–2009. *MMWR Surveillance Summaries*. 2011; 60:1–22.
- Crosby, AE.; Ortega, L.; Melanson, C. Self-directed violence surveillance: Uniform definitions and recommended data elements. Atlanta, GA: Centers for Disease Control and Prevention; 2011.
- Dittrich KA, Lutfiyya MN, Kucharyski CJ, Grygelko JT, Dillon CL, Hill TJ, Huot KL. A population-based cross-sectional study comparing depression and health service deficits between rural and nonrural U.S. military veterans. *Military Medicine*. 2015; 180:428–435. [PubMed: 25826348]
- Eaton KM, Messer SC, Garvey Wilson AL, Hoge CW. Strengthening the validity of population based suicide rate comparisons: An illustration using U.S. military and civilian data. *Suicide and Life-Threatening Behavior*. 2006; 36:182–191. [PubMed: 16704323]
- Eddleston M, Dissanayake M, Sheriff MR, Warrell DA, Gunnell D. Physical vulnerability and fatal self-harm in the elderly. *British Journal of Psychiatry*. 2006; 189(3):278–279. [PubMed: 16946365]
- Gallaway MS, Bell MR, Lagana-Riordan C, Fink DS, Meyer CE, Millikan AM. The association between U.S. Army enlistment waivers and subsequent behavioral and social health outcomes and attrition from service. *Military Medicine*. 2013; 178:261–266. [PubMed: 23707111]
- Gray GC, Chesbrough KB, Ryan MAK, Amoroso P, Boyko EJ, Gackstetter GD. Millennium Cohort Study Group. The Millennium Cohort Study: A 21-year prospective cohort study of 140,000 military personnel. *Military Medicine*. 2002; 167:483–488. [PubMed: 12099084]

- Griffith J. Army suicides: “Knowns” and interpretative framework for future directions. *Military Psychology*. 2012; 24:488–512.
- Gutierrez, PM. Blister packaging medication to increase treatment adherence and clinical response. *ClinicalTrials.gov*. 2009. List of clinical trials Retrieved from <https://clinicaltrials.gov/ct2/show/NCT01118208?term=blister+pack+gutierrez&rank=1>
- Gutierrez PM. Introduction to the special section: The costs and benefits of working with pooled data. *Military Behavioral Health*. in press.
- Gutierrez PM, Osman A, Barrios FX, Kopper BA. Development and initial validation of the Self-Harm Behavior Questionnaire. *Journal of Personality Assessment*. 2001; 77:475–490. [PubMed: 11781034]
- Hawton K, Simkin S, Deeks J, Cooper J, Johnston A, Waters K, Simpson K. U.K. legislation on analgesic packs: Before and after study of long-term effect on poisonings. *British Medical Journal*. 2004; 329:1076–1080. [PubMed: 15516343]
- Im JJ, Shachter RD, Oliva EM, Henderson PT, Paik MC, Trafton JA. Association of care practices with suicide attempts in U.S. veterans prescribed opioid medications for chronic pain management. *Journal of General Internal Medicine*. 2015; 30:979–991. [PubMed: 25693651]
- Jobes, DA. Managing suicidal risk: A collaborative approach. New York, NY: Guilford Press; 2006.
- Jobes, DA. Operation Worth Living project with suicidal soldiers at Ft. Stewart. *ClinicalTrials.gov*. 2011. List of clinical trials . Retrieved from <https://clinicaltrials.gov/ct2/show/study/NCT01300169?term=jobes+suicide&rank=1>
- Johnson LL, O'Connor SS, Kaminer B, Jobes DA, Gutierrez PM. Suicide-focused group therapy for veterans. *Military Behavioral Health*. 2014; 2:327–336.
- Joiner, TE. Why people die by suicide. Cambridge, MA: Harvard University Press; 2005.
- Joiner TE, Conwell Y, Fitzpatrick KK, Witte TK, Schmidt NB, Berlim MT, Rudd MD. Four studies on how past and current suicidality relate even when “everything but the kitchen sink” is covaried. *Journal of Abnormal Psychology*. 2005; 114:291–303. [PubMed: 15869359]
- Joiner TE, Ribeiro JD, Silva C. Nonsuicidal self-injury, suicidal behavior, and their co-occurrence as viewed through the lens of the interpersonal theory of suicide. *Current Directions in Psychological Science*. 2012; 21:342–347.
- Kemp, J. Suicide rates in VHA patients through 2011 with comparisons with other Americans and other veterans through 2010. Washington, DC: Veterans Health Administration; 2014.
- Kemp, J.; Bossarte, R. Suicide data report 2012. Washington, DC: Department of Veterans Affairs, Mental Health Services, Suicide Prevention Program; 2013. Retrieved from <http://wiiwarrior.org/downloads/suicide-data-report-2012-final.pdf>
- Kessler RC, Colpe LJ, Fullerton CS, Gebler N, Naifeh JA, Nock MK, Heeringa SG. Design of the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). *International Journal of Methods in Psychiatric Research*. 2013; 22:267–275. [PubMed: 24318217]
- Kuehn BM. Soldier suicide rates continue to rise: Military, scientists work to stem the tide. *Journal of the American Medical Association*. 2009; 301:1111–1113. [PubMed: 19293405]
- Klonsky ED. Non-suicidal self-injury in United States adults: Prevalence, sociodemographics, topography, and functions. *Psychological Medicine*. 2011; 41:1981–1986. [PubMed: 21208494]
- LeardMann CA, Powell TM, Smith TC, Bell MR, Smith B, Boyko EJ, Hoge CW. Risk factors associated with suicide in current and former U. S. military personnel. *JAMA*. 2013; 310:496–506. [PubMed: 23925620]
- Lento RM, Ellis TE, Hinnant BJ, Jobes DA. Using the Suicide Index Score to predict treatment outcomes among psychiatric inpatients. *Suicide and Life-Threatening Behavior*. 2013; 43:547–561. [PubMed: 23725632]
- Linehan MM, Comtois KA, Brown MZ, Heard HL, Wagner A. Suicide Attempt Self-Injury Interview (SASII): Development, reliability, and validity of a scale to assess suicide attempts and intentional self-injury. *Psychological Assessment*. 2006; 18(3):303–312. [PubMed: 16953733]
- Luoma JB, Villatte JL. Mindfulness in the treatment of suicidal individuals. *Cognitive and Behavioral Practice*. 2012; 19(2):265–276. [PubMed: 22745525]

- Luxton, D. Caring letters for military suicide prevention. Clinical-Trials.gov. 2011. List of clinical trials . Retrieved from <https://clinicaltrials.gov/ct2/show/study/NCT01473771?term=luxton&rank=2>
- McCarten JM, Hoffmire CA, Bossarte RM. Changes in overall and firearm veteran suicide rates by gender, 2001–2010. *American Journal of Preventative Medicine*. 2015; 48:360–364.
- National Action Alliance for Suicide Prevention. A prioritized research agenda for suicide prevention: An action plan to save lives. Rockville, MD: National Institute of Mental Health and the Research Prioritization Task Force; 2014.
- National Action Alliance for Suicide Prevention. US National Suicide Prevention Research Efforts: 2008–2013 Portfolio Analyses. Rockville, MD: National Institute of Mental Health and the Research Prioritization Task Force; 2015.
- National Center for Veterans Analysis and Statistics. FY 2012 profile of unique veteran users. Washington, DC: U.S. Department of Veterans Affairs; 2014.
- Nock MK, Deming CA, Fullerton CS, Gilman SE, Goldenberg M, Kessler RC, Ursano RJ. Suicide among soldiers: A review of psychosocial risk and protective factors. *Psychiatry: Interpersonal and Biological Processes*. 2013; 76:97–125.
- Nock MK, Stein MB, Heeringa SG, Ursano RJ, Colpe LJ, Fullerton CS, Kessler RC. Prevalence and correlates of suicidal behavior among soldiers: Results from the Army Study to Assess Risk and Resilience in Service members (Army STARRS). *JAMA Psychiatry*. 2014; 71:514–522. [PubMed: 24590178]
- O'Connor SS, Jobes DA, Comtois KA, Atkins DC, Janis K, Chessen CE, Landes SJ. Identifying outpatients with entrenched suicidal ideation following hospitalization. *Suicide and Life-Threatening Behavior*. 2012; 42:173–184. [PubMed: 22486603]
- O'Connor SS, Jobes DA, Yeargin MK, FitzGerald ME, Rodríguez VM, Conrad AK, Lineberry TW. A cross-sectional investigation of the suicidal spectrum: Typologies of suicidality based on ambivalence about living and dying. *Comprehensive Psychiatry*. 2012; 53:461–467. [PubMed: 22104555]
- Reger MA, Smolenski DJ, Skopp NA, Metzger-Abamukang MJ, Kang HK, Bullman TA, Gahm GA. Risk of suicide among U.S. military service members following Operation Enduring Freedom or Operation Iraqi Freedom deployment and separation from the U.S. Military. *JAMA Psychiatry*. 2015; 72(6):561–569. [PubMed: 25830941]
- Rizvi, SL. The therapeutic relationship in dialectical behavior therapy for suicidal individuals. In: Konrad, M.; Jobes, D., editors. *Building a therapeutic alliance with the suicidal patient*. Washington, DC: American Psychological Association; 2011. p. 255–271.
- Schoenbaum M, Kessler RC, Gilman SE, Colpe LJ, Heeringa SG, Stein MB, Cox KL. Predictors of suicide and accident death in the Army Study to Assess Risk and Resilience in Service Members (Army STARRS): Results from the Army Study to Assess Risk and Resilience in Service Members (Army STARRS). *JAMA Psychiatry*. 2014; 71:493–503. [PubMed: 24590048]
- Selby EA, Anestis MD, Bender TW, Ribeiro JD, Nock MK, Rudd MD, Joiner TE. Overcoming the fear of lethal injury: Evaluating suicide in the military through the lens of the interpersonal-psychological theory of suicide. *Clinical Psychology Review*. 2010; 30:298–307. [PubMed: 20051309]
- Smolenski, DJ.; Reger, MA.; Bush, NE.; Skopp, NA.; Zhang, Y.; Campise, RL. Department of Defense Suicide Event Report (DoDSER): Calendar year 2014 annual report. Washington, DC: U.S. Department of Defense; 2014.
- Trockel M, Karlin BE, Taylor CB, Brown GK, Manber R. Effects of cognitive behavioral therapy for insomnia on suicidal ideation in veterans. *Sleep*. 2015; 38:259–295. [PubMed: 25515115]
- Ursano RJ, Colpe LJ, Heeringa SG, Kessler RC, Schoenbaum M, Stein MB. The Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). *Psychiatry: Interpersonal and Biological Processes*. 2014; 77:107–119.
- Ursano RJ, Heeringa SG, Stein MB, Jain S, Raman R, Sun X, Kessler RC. Prevalence and correlates of suicidal behavior among new soldiers in the U.S. Army: Results from the Army Study to Assess Risk and Resilience in Servicemembers (ARMY STARRS). *Depression and Anxiety*. 2015; 32:3–12. [PubMed: 25338964]

- National Institute of Mental Health. NIMH strategic plan for research. 2015. (NIH Publication No. 02-2650). Retrieved from <http://www.nimh.nih.gov/about/strategic-planning-reports/index.shtml>
- Walser RD, Garvert DW, Karlin BE, Trockel M, Ryu DM, Taylor CB. Effectiveness of acceptance and commitment therapy in treating depression and suicidal ideation in Veterans. *Behaviour Research and Therapy*. 2015; 74:25–31. [PubMed: 26378720]
- Walser, RD.; Sears, K.; Chartier, M.; Karlin, BE. Acceptance and commitment therapy for depression in veterans. Washington, DC: U.S. Department of Veterans Affairs; in press
- Xu, JQ.; Kochanek, KD.; Murphy, SL.; Arias, E. Mortality in the United States, 2012. Hyattsville, MD: National Center for Health Statistics; 2014. NCHS data brief, no 168
- Yip PS, Caine E, Yousuf S, Chang SS, Wu KC, Chen YY. Means restriction for suicide prevention. *Lancet*. 2012; 379:2393–2399. [PubMed: 22726520]

Figure 1.

Relative odds of suicide attempt methods used by veterans and service members

Note. The points represent the odds ratio for each method, with the dashed line at 1.0 indicating no difference between veterans and service members. A dot on the left side of the dashed line indicates Veterans had greater odds of using a method, while a dot on the right side means service members had greater odds. The horizontal line around the point represents the 95% confidence interval and if it does not cross the dashed line, the difference is statistically significant.

TABLE 1**Participant Demographic and Military Characteristics**

Variable	Service Members (N = 1,013)	Veterans (N = 746)	Total (N = 1,759)
Female	271 (27%)	86 (12%)	357 (20%)
Race and ethnicity			
Caucasian	726 (72%)	496 (67%)	1222 (70%)
African American	129 (13%)	133 (18%)	262 (15%)
Mixed race	89 (9%)	41 (6%)	130 (7%)
Asian American/Pacific Islander	7 (1%)	13 (2%)	20 (1%)
American Indian/Alaska Native	45 (4%)	26 (4%)	71 (4%)
Hispanic	188 (19%)	78 (11%)	266 (15%)
Service branch			
Army	642 (63%)	403 (54%)	1045 (60%)
Marines	157 (16%)	106 (14%)	263 (15%)
Navy	173 (17%)	149 (20%)	322 (18%)
Air Force	41 (4%)	88 (12%)	129 (7%)
Mean years of military service	4.76 (4.57)	5.62 (4.89)	5.13 (4.72)
Combat deployment	477 (47%)	297 (40%)	744 (44%)

TABLE 2

Proportions of Suicide Behaviors in Service Members and Veterans in Treatment for Suicide Risk

Variable	Service Members(N = 1,013)	Veterans(N = 746)	Total Sample(N = 1,759)
Lifetime nonsuicidal self-injury	341 (34%)	126 (17%)	467 (27%)
Lifetime suicide attempt	519 (51%)	342 (46%)	861 (49%)
Among suicide attempt survivors			
Number of attempts	2.57 (19.4)	2.96 (25.3)	2.74 (22.1)
Premilitary attempt	207 (40%)	76 (22%)	276 (32%)
Active-duty attempt	310 (60%)	72 (21%)	362 (42%)
Veteran attempt	—	195 (57%)	—
Maximum lethality	3.35 (1.54)	3.71 (1.48)	3.47 (1.53)
Method of suicide attempt			
Cutting	298 (29%)	150 (20%)	448 (26%)
Drowning	16 (2%)	7 (1%)	23 (1%)
Burning	72 (7%)	37 (5%)	109 (6%)
Hanging/strangling	114 (11%)	66 (9%)	180 (10%)
Headbanging/hitting with object	106 (11%)	63 (8%)	169 (10%)
Poisoning	28 (3%)	21 (3%)	49 (3%)
Asphyxiation/smothering	22 (2%)	21 (3%)	43 (2%)
Stabbing/puncturing	30 (3%)	25 (3%)	55 (3%)
Jumping from a height	31 (3%)	28 (4%)	59 (3%)
Gunshot	34 (3%)	37 (5%)	71 (4%)
Drug or medication overdose	256 (25%)	292 (39%)	548 (31%)
Other method	139 (14%)	97 (13%)	236 (13%)

^aMean (standard deviation).

Summary of Regression Analysis Testing Interaction Effects of Military Service Status and Correlates of Lifetime Suicide Attempt

TABLE 3

Variable	Odds Ratio	Robust Standard Error	95% CI Lower	Upper	p
Active duty × Female	0.75	0.23	0.41	1.36	0.34
Active duty × Race					
African American	0.93	0.28	0.52	1.66	0.80
Mixed race	0.88	0.37	0.38	2.00	0.75
Asian American/Pacific Islander	1.95	1.19	0.58	6.48	0.28
American Indian/Alaska Native	1.65	1.77	0.20	13.49	0.64
Active duty × Hispanic ethnicity	0.55	0.17	0.30	1.01	0.05
Active duty × Military branch					
Marines	0.82	0.26	0.45	1.51	0.52
Navy	0.56	0.16	0.33	0.97	0.04
Air Force	1.12	0.49	0.48	2.65	0.79
Active duty × Service years	0.96	0.03	0.91	1.01	0.13
Active duty × Combat deployed	1.90	0.44	1.20	3.01	.006*
Active duty × Nonsuicidal self-injury	0.33	0.09	0.20	0.55	< .001*

Note. The largest category in the sample was selected as the comparison group in all interaction analyses with categorical variables.

^a Caucasian was used as the comparison group for service status × race analyses.

^b Army was used as the comparison group for service status × military branch analyses.

* Statistically significant with Bonferroni correction ($p < .007$).