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Ten-Year Trend and Correlates of Reported Posttraumatic Stress Disorder among Young Male Veteran Suicide Decedents—Results from the National Violent Death Reporting System, 16 U.S. States, 2005–2014

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Abstract

Objective: This study examined trends and correlates of reported post-traumatic stress disorder (PTSD) among young male Veteran suicide decedents, using data from the National Violent Death Reporting System from 2005–2014 on 1,362 male U.S. Veteran suicide decedents aged 18–34 years.

Methods: Prevalence of reported PTSD (i.e., diagnosis/symptoms) was determined by mental health diagnostic fields and narratives and examined by year. Demographic, incident, and precipitating circumstance characteristics correlated with reported PTSD were identified.

Results: One-hundred ninety-eight (15%) decedents had PTSD evidence. A 30-fold increase in reported PTSD prevalence occurred among decedents aged 25–34 years; however, no increase was observed among younger decedents. Reported PTSD was associated with past deployments (odds ratio (OR): 14.5, 95% confidence interval (95% CI): 9.0–23.4); depression (OR: 1.8, 95% CI: 1.2–2.6); and divorce (OR: 1.7, 95% CI: 1.0–2.7). Recent crisis (OR: 0.6, 95% CI: 0.3–0.9) was inversely associated with reported PTSD.

Conclusions: Reported PTSD prevalence substantially increased among Veteran suicide decedents aged 25–34 years suggesting it is beginning to play a larger role in suicide for this group. Few correlated suicide risk factors were found, suggesting that if symptoms of PTSD are

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present, heightened vigilance by providers for suicide risk might be warranted, irrespective of evidence of other risk factors.

Since the launch of military operations in Afghanistan (2001) and Iraq (2003), the suicide rate has increased among active duty military personnel and young Veterans (Bachynski et al., 2012; Schoenbaum et al., 2014; U.S. Department of Veterans Affairs Office of Suicide Prevention, 2016). Previous studies have examined whether deployment during these wars increases the risk of suicidal behaviors (Bryan et al., 2015; Kang et al., 2015). However, results from these studies have been mixed and the associations between deployment and suicide remain unclear. Kang et al. (2015) reported that suicide was not associated with a history of deployments to the Afghanistan/Iraq war zones among military Veterans who were followed through 2009. In contrast, Bryan et al. (2015) conducted a meta-analysis of 22 published articles looking at the relationship between deployment, combat exposure, and suicidal outcomes, and reported that suicidal outcomes were associated with deployments involving combat and killing, and exposure to other stressful events.

One potential mediating risk factor between combat exposure and suicide is the development of posttraumatic stress disorder (PTSD), a mental disorder in which a stressful or traumatic life event, such as combat, adverse childhood experiences, or sexual assault, can result in symptoms of panic, terror, dread, grief, or despair (American Psychiatric Association, 2013). The reason this factor is a “potential” mediating risk factor is that the literature on the association between PTSD and suicide among Veterans has also shown mixed results. There is evidence that individuals with PTSD are at increased risk of suicide (Nock et al., 2017; Ramchand, Rudavsky, Grant, Tanielian, & Jaycox, 2015; Ramsawh et al., 2014; U.S. Department of Veterans Affairs, National Center for PTSD; Wisco, Marx, Holowka et al., 2014; Wisco, Marx, Wolf et al., 2014). However, other studies have shown there to be no association between PTSD and suicide ideation or behavior among Veterans after accounting for other psychiatric comorbidities (Britton et al., 2017; Conner et al., 2014). Trends in the two-year prevalence of PTSD diagnoses among nonactive duty military Veterans seen by Veterans Health Administration (VHA) providers increased from 4% in 2003 to 18% in 2006. A subsequent VHA study showed an increase in the use of VHA specialty mental health care services for PTSD among returning Veterans (Hermes, Rosenheck, Desai, & Fontana, 2012). The proportion of Veterans using VHA services for PTSD treatment increased over fivefold from 1.7% to 8.7% between 2005 and 2010, which showed that PTSD in fact emerged as a significant mental health condition among Veterans. Research is needed to examine whether the increasing prevalence of PTSD diagnosis corresponds to the emergence of PTSD as a more common characteristic of suicide decedents.

We examine PTSD trends and correlates among young male Veteran suicide decedents over a 10-year period, to determine whether PTSD has become an increasingly prevalent preceding circumstance of suicide among these decedents. We selected this population because this group has shown the greatest increase in suicide since 2005 (U.S. Department of Veteran Affairs, 2018). We wanted to include a separate analysis for females of the same age but small sample sizes precluded such a detailed analysis.

We used data from a multistate violent death surveillance system, the National Violent Death Reporting System (NVDRS), which is a public health data source that can supplement previous VHA reports in several ways. First, with the NVDRS data, we examined circumstances of suicide for all Veterans regardless of their ability to obtain VHA services. This study population therefore includes the entire Veteran population in the states included in the sample, both VHA and non-VHA Veterans. Second, NVDRS collects reports from law enforcement agents and coroners/medical examiner investigators, which provide unique perspectives such as: (1) reports of an existing PTSD diagnosis known to witnesses; and (2) reports from witnesses on whether the decedent was known to suffer from PTSD, regardless of available diagnostic history.

Finally, these data allowed us to examine which decedent demographic characteristics, incident characteristics, and health life-stress circumstances were associated with reported PTSD among young Veteran suicide decedents. Such information is often unavailable in the VHA data systems and could help clinicians see how Veteran suicide decedents with reported PTSD are unique from other Veteran suicide decedents, which might in turn inform PTSD treatment.

METHODS

Data Source

The National Violent Death Reporting System is a state-based surveillance system that links data on violent deaths, such as suicides, from multiple sources, including coroner/medical examiner reports, law enforcement reports, toxicology, and death certificates, into one de-identified database (Lyons, Fowler, Jack, Betz, & Blair, 2016). The coroner/medical examiner and law enforcement reports contain detailed narratives describing the incident. NVDRS captures details on decedent characteristics, the mechanisms or weapons involved, and the preceding and precipitating circumstances of violent deaths. Data are abstracted from all sources available for each violent death and coded for NVDRS by trained abstractors in each NVDRS state (Centers for Disease Control and Prevention, 2016).

Study Population

This study used 2005–2014 data on suicide deaths from 16 U.S. states (Alaska, Colorado, Georgia, Kentucky, Maryland, Massachusetts, New Jersey, New Mexico, North Carolina, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wisconsin) that participated in NVDRS during the entire study period. Records for suicide decedents aged 18–34 years, the Veteran age group experiencing the greatest rate increase (U.S. Department of Veterans Affairs and Office of Suicide Prevention, 2016), were examined. NVDRS has a variable that identifies decedents who ever served in the U.S. military; all decedents for which this variable was endorsed were classified as active duty or Veteran, using three free text occupation fields, an industry field, and narrative data. If any of the free text fields or the narrative field summarizing circumstances related to the suicide indicated a current military occupation, the decedent was classified as active duty; if the fields indicated a non-Military occupation, the decedent was classified as a Veteran; and if the fields indicated that current occupation was unknown or indicated an ambiguous occupation that could not be

determined to represent active duty or civilian status, the decedent was classified as unknown status. For these fields, occupation is written as open text with terms like “soldier” and “Army.” A previous sample of NVDRS cases linked to Department of Defense data discovered a military occupation was clearly listed in at least one field for 93% of decedents known to currently be in the military (Logan et al., 2015). Using these fields, two authors separately classified decedents according to Veteran status and achieved a kappa of .674. A previous study used the same methods with three abstractors and reached a kappa of .878 (Logan, Fowler, Patel, & Holland, 2016). To improve upon initial coding discrepancies, the two authors reconciled different classifications and listed “unknown” status where unable to reconcile with the available information.

To improve understanding of the epidemic of suicides among the young Veteran population (discharged from service), the sample was restricted to decedents classified as Veterans. Further, because of the small number of female Veteran decedents ($n = 102$, 7%), the sample was restricted to male decedents.

Measures

The National Violent Death Reporting System provides details on decedent demographics and the circumstances of death. Demographic data and details on the incident and the circumstances of death are abstracted from death certificates, coroner/medical examiner reports, and law enforcement reports (Paulozzi, Mercy, Frazier, & Annest, 2004). To gather this information, investigators process forensic evidence and interview family members, friends, and others associated with the decedent, as well as witnesses to the death (U.S. Department of Justice, 1999).

Investigators commonly document the circumstances believed to have contributed to death on the basis of available evidence. Such circumstances are used to help make a determination of cause and manner of death. For example, many decedents might have financial problems but these problems may only be documented if there is sufficient evidence linking them to the death. Therefore, many problems may not be listed in a report, even if the decedent had them, if the evidence pointed to other reasons for why the suicide decedent took his or her own life. Examples of precipitating circumstances of death include recent crises (i.e., current/acute precipitating events within 2 weeks of death) or precipitating arguments; and relationship, financial, and/or legal problems. Other important factors preceding death are captured, such as current depressed mood, current mental health or substance abuse problem, current or history of mental health or substance abuse treatment, history of prior suicide attempts, disclosing suicidal intent to others, and leaving a suicide note. Details on coding of these variables are described elsewhere (Centers for Disease Control and Prevention, 2016, Logan et al., 2015).

There are several fields where mental health disorder diagnoses can be endorsed. The characteristic of interest, PTSD, was endorsed if any of these fields indicated evidence of a PTSD diagnosis. The narrative text fields were also searched for the terms “PTSD,” “post-traumatic,” “post traumatic,” “post-tra,” “post tra,” “post-tru,” and “post tru,” to further capture deaths in which there was no noted PTSD diagnosis, but for which witness report or other information indicated the presence of PTSD. Narratives for records in which one or

more of these terms appeared were reviewed manually to ensure the term indicated PTSD referred to symptoms or a diagnosis of the decedent. Because the evidence of PTSD could come from a diagnosis or other witness report that the decedent was experiencing PTSD, this measure was defined as “reported PTSD.”

Race and ethnicity were combined into one variable indicating White, non-Hispanic; Black, non-Hispanic; other race, non-Hispanic; or Hispanic. Marital status was classified as never married, single unspecified; married; divorced; married but separated; or widowed. The location of death was dichotomized to having died outside of the home or at home, and the mechanism of the suicide was categorized as firearm, sharp instrument, poisoning, hanging/suffocation, or other. A dichotomous variable was created to indicate mention of a previous deployment in the narrative; records with deployment mentioned were manually reviewed to ensure the term referred to the respective decedent. Because information about deployment is not captured by an existing field within NVDRS, it is not collected systematically across all decedents, but is recorded in the incident narrative when specifically mentioned by a family member, friend, or other witness; deployment information entered into the narrative field can be interpreted to indicate that deployment was thought to be related to the suicide death. The remaining circumstances of the deaths, as captured by fields within NVDRS, were endorsed as present on the basis of scene evidence.

Statistical Analyses

We first describe the decedents' demographic characteristics, the incident characteristics, the circumstances of death, and the presence of reported PTSD for the total sample. The sample was stratified by age group (i.e., 18–24 and 25–34 years) to see if there were significant differences between younger and older Veterans. Differences in suicide circumstances may be related to the two groups being at different life stages. Older Veterans may be more likely to have families, employment, and health care benefits while younger Veterans who have been recently discharged from military service, or received an early discharge for medical or other reasons. They may also be more commonly unemployed, unmarried, and still attempting to acquire medical and mental health benefits through either the VA or a place of employment. We made comparisons using the age 24 year cut point to maintain consistency with the 2016 VA report titled “Suicide among Veterans and Other Americans” (U.S. Department of Veterans Affairs, 2016, page 19, table 5), which showed the suicide rate among VHA males of the Iraq/Afghanistan war in this age group increasing nearly 10-fold from 2005 to 2014. This increase was far greater than the rate increases experienced by those in other age groups signifying that this group could be unique from those of older ages.

We also present the proportion of Veteran suicide decedents with reported PTSD in each year and for both age groups; joinpoint regression was used to detect trend changes over time and to calculate annual percent change (APC) in proportion. Average annual percent change (AAPC) was calculated as a weighted average of the yearly APC, to indicate overall change over time. Years with zero counts (2005 for both age groups and 2006 for 18- to 24-year-olds) in number of decedents with reported PTSD were imputed as 0.01 to allow for AAPC calculations. The suicide rate for each year was calculated by dividing the number of

deaths in that year by the estimated male Veteran population in the 18–24 and 25–34 year age groups for the 16 states in the sample. Veteran Population Projection Model Data produced by the Department of Veterans Affairs were used for the estimated male Veteran population (U.S. Department of Veterans Affairs, VetPop).

Last, we used logistic regression to examine associations between demographics and circumstances of the deaths and presence of reported PTSD among decedents. While a difference in reported PTSD presence was detected between the age groups, the correlates associated with reported PTSD did not differ by age; therefore, we combined age groups for this analysis. Crude and adjusted prevalence odds ratios (OR) and 95% confidence intervals (CI) were calculated; demographic variables and all other circumstances were included in adjusted models.

RESULTS

The study sample comprised 1,362 male military Veteran decedents between the ages of 18 and 34 years. Among the sample, the mean age was 22 years among decedents in the 18–24 year age group, and 30 years among decedents in the 25–34 year age group. The majority of decedents were aged 25–34 years ($n = 1,014$, 74%) and of non-Hispanic white race/ethnicity ($n = 1,061$; 78%). An estimated 52% were single, never married, 65% died at home, and 61% died by the use of a firearm (Table 1).

Decedents in both age groups were similar in terms of race/ethnicity and mechanism of suicide, but differed in certain other characteristics (Table 1) at $p < .05$ level. Higher proportions of those aged 25–34 years were married (34% vs. 11%) or divorced (19% vs. 5%), and a lower proportion were single (43% vs. 81%), compared to those aged 18–24 years. Compared to decedents in the younger age group, higher proportions of decedents of the older age group died at home (66% vs. 60%) had evidence of other (nonintimate partner) relationship problems (12% vs. 8%) and had a recent crisis (28% vs. 22%). For the entire sample, 37% had a reported depressed mood at time of death, 26% had a depression diagnosis, 39% had evidence of alcohol dependence or intoxication at time of death, and 17% had evidence of substance abuse.

One hundred and ninety-eight decedents (15%) had evidence of reported PTSD (Table 1). Seventeen percent of decedents aged 25–34 years had reported PTSD, compared to 8% of decedents aged 18–24 years. Overall, reported PTSD prevalence among decedents increased over time, with the increase mainly among decedents aged 25–34 years (Figure 1). An increase in reported PTSD prevalence was not observed among decedents aged 18–24 years. None of the decedents in the 18–24 year age group in 2005 or 2006 had reported PTSD; starting in 2007, between one and six decedents had reported PTSD each year (Figure 2a). The proportion of decedents among this age group with reported PTSD fluctuated over time, ranging from 0% in 2005 to a high of 15% in 2013, for an AAPC of -1.5% (95% CI: -16.1% , 15.8%). No join points were identified, indicating that there were no significant changes in the trend over time. The coinciding suicide rate among male Veterans aged 18–24 years increased from 37.6 per 100,000 in 2005 to 59.1 per 100,000 in 2014 (Figure 2a).

Among decedents aged 25–34 years, none had evidence of reported PTSD in 2005, but 42 decedents had evidence of reported PTSD in 2014 (Figure 2b). The proportion of decedents with evidence of reported PTSD also increased over time among this age group, from 0% in 2005 to 30.7% in 2014, corresponding to an AAPC of 27.1% (95% CI: 16.9, 38.2). No join points were identified in this age group either. The suicide rate among this male age group increased from 24.1 per 100,000 in 2005 to 31.7 per 100,000 in 2014 (Figure 2b).

The associations between reported PTSD and demographic, incident, and circumstance characteristics are presented in Table 2. Being in the 25–34 year age group was positively associated with the presence of reported PTSD, both in crude analyses and after controlling for all demographics and circumstances (aOR = 2.28, 95% CI = (1.39, 3.74)). Compared to being single, being divorced was associated with higher odds of reported PTSD (aOR = 1.68, 95% CI = (1.02, 2.74)). The presence of reported PTSD was not associated with race or ethnicity of decedents.

Several circumstances were associated with reported PTSD after controlling for all demographics and circumstances. Having any mention of deployment in the narrative was more common among decedents with PTSD (32%) than among those without (4%), and the odds of having reported PTSD were much higher among decedents with deployment mentioned than among decedents with no deployment mentioned (aOR = 14.53, 95% CI = (9.03, 23.39)). Over one-third of decedents with reported PTSD (37%) had evidence of a depression diagnosis, compared to 24% of decedents with no evidence of PTSD. Decedents with a depression diagnosis had higher odds of having evidence of reported PTSD, compared to those with no depression diagnosis (aOR = 1.75, 95% CI = 1.21, 2.55). Conversely, having had a recent crisis was less common among decedents with reported PTSD (14%) than among those without (25%), and the odds of having reported PTSD were lower among those with a recent crisis than among those without a recent crisis (aOR = 0.56, 95% CI = 0.34, 0.90).

DISCUSSION

This study is one of the first to examine reported PTSD trends and correlates among young male U.S. military Veteran suicide decedents. The use of NVDRS data from 16 U.S. states allowed for an in-depth look at decedent demographics and factors and circumstance factors associated with the presence of reported PTSD, among all Veteran suicide decedents, both VHA and non-VHA. Fifteen percent of young male Veteran suicide decedents aged 18–34 years old in this study had evidence of reported PTSD, and this proportion increased significantly during the study period among those aged 25–34.

The VA has reported weighted prevalence estimates of a positive screen for PTSD among Veterans of a similar age who served in the era of Operations Enduring Freedom and Iraqi Freedom (OEF/OIF) (Dursa, Reinhard, Barth, & Schneiderman, 2014). The VA Office of Public Health analyzed survey data from 20,563 VHA and non-VHA Veterans and discovered that PTSD was present in 13.5% of the overall sample: 16.2% of males who deployed and 10.5% of males who did not deploy. While our study was unable to compare Veteran suicide decedents to a living Veteran control group, and hence determine whether

PTSD is a suicide-related risk factor, our prevalence estimate for PTSD among males 25–34 years of age in 2014, estimated at 31%, suggests that PTSD trends among young male Veteran suicide decedents are outpacing prevalence estimates for PTSD in the general young OEF/OIF Veteran population. However, more research is still needed to explore whether PTSD is truly emerging as a preeminent suicide risk factor among OEF/OIF Veterans because reports of PTSD were not highly common among male Veteran suicide decedents aged 18–24 years, a group that has experienced the greatest increase in suicide rates (U.S. Department of Veterans Affairs, 2016).

There could be multiple interpretations of our trend findings and the differences observed between the two suicide decedent age groups. First, the lack of increase in reported PTSD prevalence among male suicide Veterans aged 18–24 years, a group in which the suicide rate did dramatically increase during this time period, could potentially be attributed to poor PTSD detection or reporting among younger male Veterans. Veterans in the younger group likely died closer in time to military discharge and therefore could have had less time between discharge and death for PTSD symptoms to be recognized and/or diagnosed, especially since PTSD can also follow different trajectories, with potential for delayed symptoms onset (Porter, Bonanno, Frasco, Dursa, & Boyko, 2017). Another possibility is that the younger age group had less time in the military and therefore less time to be exposed to a traumatic event. Last, PTSD could have contributed to trends for those aged 25–34 but other factors account for the increasing rates among younger Veterans. For example, those aged 18–24 years who were no longer active duty might not have completed their service commitment. They might have left the military for unknown reasons and these reasons could contribute to suicide risk.

The reasons for the sudden increase in reported PTSD for the Veteran suicide decedents aged 25–34 years remain unclear based on this data source. The strongest and most robust factor associated with reported PTSD in our sample is “deployment-related.” Therefore, this factor might prompt future exploration into what propagated the increase in PTSD among decedents aged 25–34 years. This finding also mirrors reports from other studies linking PTSD with military deployment experiences (Bryan et al., 2015; Fischer, 2015). This age cohort of Veterans may have experienced more combat exposure during their deployments, such as during the 2007 and 2009 troop surges, although other data resources will be needed to explore this hypothesis. For our study, we were unable to confirm whether the reported PTSD followed or preceded deployment or specific combat experiences in many cases. However, upon review of the decedent narratives, over one-third of decedents with reported PTSD and a mention of past deployments specifically linked the reported PTSD to past deployments (data not shown). For example, family members mentioned that a decedent was experiencing PTSD because of his recent tour in Iraq or that PTSD symptoms were a result of experiences during multiple overseas deployments. More work is still needed to examine which deployment-related experiences might have perpetuated the increase in PTSD among Veteran suicide decedents aged 25–34 years.

Regardless of the interpretation of the observed trends, the increasing prevalence of reported PTSD among young male Veteran suicide decedents of ages 25–34 years should warrant further attention. Independent of any association with suicide risk, PTSD itself is a

morbidity that can include both physical and mental symptoms, and evidence-based treatment is available. Given that witnesses were able to report the PTSD among these decedents, it indicates that family members, friends, or other people familiar with the decedents were aware of the diagnosis and/or signs/symptoms. They might therefore be targeted for interventions to help those suffering from PTSD symptoms to be diagnosed and seek treatment, as well as for gatekeeper and other training to help recognize signs of elevated suicide risk (Isaac et al., 2009).

With respect to the correlates of PTSD among this Veteran decedent population, we discovered slightly higher proportions of suicide decedents with reported PTSD were divorced, compared to their counterpart suicide decedents without PTSD, suggesting there might be some association with being divorced. However, there was no association between reported PTSD and current intimate partner problems immediately prior to death. Intimate partner problems, in general, were the most prevalent precipitating circumstances for all suicides regardless of whether the decedent had reported signs of PTSD. Further research is needed to more thoroughly explore the association between being divorced and having reported PTSD, as well as the association between intimate partner problems and suicide, to see how these factors interrelate and potentially contribute to suicide among young Veterans.

We also did not find any associations between having reported PTSD and many common precipitating factors such as other relationship, financial, criminal, and job problems, and having a recent crisis was inversely associated with reported PTSD. Collectively, these findings may indicate that PTSD can contribute to the suicide death in the absence of other triggering events, but more work is still needed to confirm the attributable risk of PTSD on suicide, and it is possible that other risk factors for suicide that are not captured by NVDRS may have been present among decedents with reported PTSD. Nevertheless, given the high prevalence of reported PTSD among male Veteran suicide decedents aged 25–34 years, enhancing screening and treatment for suicide ideation and behavior among those with PTSD symptoms might help reduce suicide fatalities.

Having a depression diagnosis was positively associated with reported PTSD. This association could reflect a complex mental health history, indicating that decedents experiencing depression were also more susceptible to experiencing PTSD (or vice versa) or that one condition precipitates the other. Previous studies have shown an association between comorbid depression and PTSD (Ramsawh et al., 2014); however, it has also been suggested that any effect of PTSD on suicide risk might be mediated by the presence of other mental health diagnoses, including depression, which could also explain some of the association. For example, Conner et al. (2014) studied the association between PTSD and suicide among 5.9 million individuals who received care in the VHA during fiscal years 2007–2008 and discovered that PTSD diagnoses were inversely associated with suicide after controlling for major depressive disorder. Britton et al. (2017) studied suicide mortality among male Veterans discharged from VHA acute psychiatric units—a particularly high-risk group—during 2005–2010 and also discovered that PTSD diagnoses were inversely associated with suicide after controlling for other mental health conditions. Some studies discovered that mental health is poorer among Veterans who have PTSD in combination with prior combat exposure versus having a PTSD diagnosis alone (Armenta et al., 2018;

Donoho, Bonanno, Porter, Kearney, & Powell, 2017). Regardless of the reason behind the association, this finding indicates that particular vigilance to screen for PTSD among those with depression or other mental health disorder symptoms might help identify PTSD.

This study was subject to certain limitations. First, the sample was limited to 16 U.S. states, so the findings are not necessarily generalizable to the population of young male Veterans in the nation as a whole. Second, the independent variables and the outcome variable of interest, reported PTSD, were dependent upon the information available in the coroner/medical examiner reports, law enforcement reports, toxicology, and vital statistics records; the absence of evidence of a given variable cannot necessarily be interpreted as evidence of absence of that variable. Medical records are not required sources for NVDRS data, and so, information from such records is not routinely available for abstraction. The prevalence of reported PTSD and precipitating factors, such as deployment history, is likely an underestimate of the true prevalence because such factors are usually listed if investigators believed they contributed to the death. In addition, there may be missed or misclassified factors by investigators. Third, this analysis used the presence of PTSD diagnosis and/or symptoms, which may or may not correspond directly to the actual presence of the condition at the time of death, and therefore PTSD was considered reported rather than confirmed. One concern about this variable is that an increase in general perception of PTSD by the public could lead to increased reporting of PTSD diagnosis or symptoms among the decedents. However, such general perceptions would be expected to apply to all young Veteran age groups. It would be unlikely to see a stark increase in reported PTSD in one age group and not in another group close in age, if the increase was driven by a general increase in knowledge of or perception of PTSD. Nevertheless, it is best to exercise caution and replicate the study of PTSD among Veteran suicide decedents aged 25–34 years using other data sources given the limitations of the data sources for this variable in NVDRS. Fourth, calculation of suicide rates for the two age groups used estimated Veteran population size for denominators, and as such may have over- or underestimated the actual rates. Fifth, the data were cross-sectional in nature, and therefore, we were unable to determine whether PTSD followed or preceded deployment. Sixth, small numbers in the sample for certain demographic categories limited the ability to examine reported PTSD prevalence and associations, including race/ethnicity categories such as American Indian and Asian/Pacific Islander. The small number of female Veteran decedents limited the ability to include them in the analysis sample.

The prevalence of reported PTSD increased 30-fold among male Veteran suicide decedents aged 25–34 years during the study period, suggesting this risk factor is emerging as a more prevalent characteristic among male Veteran suicide decedents of these ages than previously described. This supports findings from studies examining PTSD and suicidal behaviors among Veterans accessing VHA services (Jakupcak et al., 2009) and further adds that the relationship is present among all young male Veterans, not just those accessing such services. Suicide decedents with reported PTSD did not differ from those without reported PTSD on most other common suicide-related circumstances, suggesting that if symptoms of PTSD are present, heightened vigilance by providers for suicide risk might be warranted, irrespective of evidence of other known risk factors.

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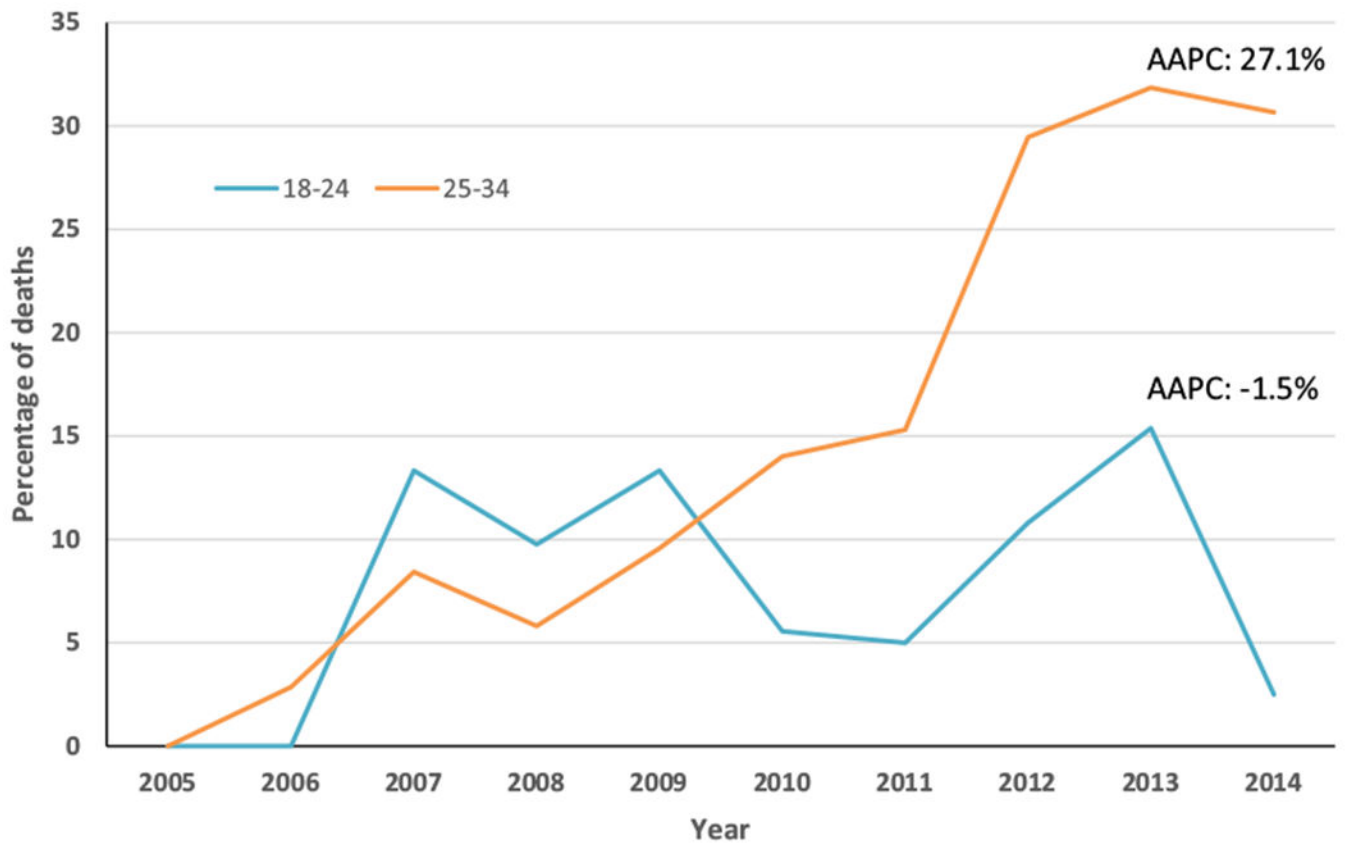


Figure 1. Percentage of suicide deaths with evidence of posttraumatic stress disorder (PTSD) among male Veteran suicide decedents, ages 18–34 years, National Violent Death Reporting System, 2005–2014.



Figure 2. Number of suicide deaths among those with and without posttraumatic stress disorder (PTSD) and suicide rate among male Veteran suicide decedents, ages 18–24 years (2a) and 25–34 years (2b), National Violent Death Reporting System, 2005–2014.

Demographic and Incident Characteristics by Age Group Among Young Male Veteran Suicide Decedents, Ages 18–34, National Violent Death Reporting System, 2005–2014

TABLE 1

| | <u>Total (n = 1,362)</u> | | <u>18–24 years old (n = 348)</u> | | <u>25–34 years old (n = 1,014)</u> | | p-Value |
|-----------------------------------|--------------------------|----|----------------------------------|----|------------------------------------|----|---------|
| | N | % | N | % | N | % | |
| Evidence of PTSD | 198 | 15 | 27 | 8 | 171 | 17 | <.001 |
| Race/ethnicity ^a | | | | | | | |
| White, non-Hispanic | 1,061 | 78 | 263 | 76 | 798 | 79 | .109 |
| Black, non-Hispanic | 151 | 11 | 36 | 10 | 115 | 11 | |
| Other, non-Hispanic | 68 | 5 | 24 | 7 | 44 | 4 | |
| Hispanic | 81 | 6 | 24 | 7 | 57 | 6 | |
| Marital status ^a | | | | | | | |
| Never married, single unspecified | 714 | 52 | 281 | 81 | 433 | 43 | <.001 |
| Married | 384 | 29 | 40 | 11 | 344 | 34 | |
| Divorced | 211 | 15 | 17 | 5 | 194 | 19 | |
| Married but separated | 25 | 3 | 6 | 2 | 29 | 3 | |
| Widowed | 7 | 1 | 2 | 1 | 5 | 1 | |
| Incident characteristics | | | | | | | |
| Location of death | | | | | | | |
| Died outside of home | 479 | 35 | 138 | 40 | 341 | 34 | .042 |
| Died at home | 883 | 65 | 210 | 60 | 673 | 66 | |
| Method ^a | | | | | | | |
| Firearm | 834 | 61 | 214 | 61 | 620 | 61 | .908 |
| Hanging | 325 | 24 | 87 | 25 | 238 | 23 | .564 |
| Poisoning | 134 | 10 | 26 | 7 | 108 | 11 | .086 |
| Sharp instrument | 18 | 1 | 3 | 1 | 15 | 1 | .384 |
| Circumstances | | | | | | | |
| Health related ^b | | | | | | | |
| Current depressed mood | 499 | 37 | 122 | 35 | 377 | 37 | .478 |
| Diagnosis of depression | 348 | 26 | 80 | 23 | 268 | 26 | .204 |

| | Total (n = 1,362) | | 18-24 years old (n = 348) | | 25-34 years old (n = 1,014) | | p-Value |
|---|-------------------|----|---------------------------|----|-----------------------------|----|---------|
| | N | % | N | % | N | % | |
| Alcohol dependence, or suspected intoxication | 536 | 39 | 136 | 39 | 400 | 39 | .904 |
| Other substance abuse | 231 | 17 | 57 | 16 | 174 | 17 | .738 |
| Life stress ^b | | | | | | | |
| Intimate partner problems | 649 | 48 | 163 | 47 | 486 | 48 | .725 |
| Other relationship problems | 126 | 9 | 43 | 12 | 83 | 8 | .021 |
| Criminal and civil legal problems | 198 | 15 | 47 | 14 | 151 | 15 | .527 |
| Job problems | 232 | 17 | 53 | 15 | 179 | 18 | .300 |
| Financial problems | 154 | 11 | 32 | 9 | 122 | 12 | .149 |
| Recent crisis | 318 | 23 | 96 | 28 | 222 | 22 | .030 |
| Deployment mentioned in narrative | 107 | 8 | 29 | 8 | 78 | 8 | .701 |
| Other preceding circumstances ^b | | | | | | | |
| Disclosed intent | 398 | 29 | 97 | 28 | 301 | 30 | .522 |
| Left a note | 391 | 29 | 108 | 31 | 283 | 28 | .266 |

Data from 16 states: Alaska, Colorado, Georgia, Kentucky, Maryland, Massachusetts, New Jersey, New Mexico, North Carolina, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wisconsin.

^aCategories might not sum to total because of missing data.

^bCategories not mutually exclusive.

TABLE 2
 Demographic and Incident Characteristics by PTSD Status and Odds of Having posttraumatic stress disorder (PTSD) Among Young Male Veteran Suicide Decedents, Ages 18–34 years, National Violent Death Reporting System, 2005–2014

| | No PTSD (n = 1,164) | | PTSD (n = 198) | | | OR | 95% CI | aOR ^a | 95% CI | |
|-----------------------------------|---------------------|----|----------------|----|------|-------------|--------|------------------|--------|--|
| | N | % | N | % | % | | | | | |
| Demographics | | | | | | | | | | |
| Age group (years) | | | | | | | | | | |
| 18–24 | 321 | 28 | 27 | 14 | Ref | Ref | | Ref | | |
| 25–34 | 843 | 72 | 171 | 86 | 2.41 | 1.57, 3.69 | 2.28 | 1.39, 3.74 | | |
| Race/ethnicity^b | | | | | | | | | | |
| White, non-Hispanic | 909 | 78 | 152 | 77 | Ref | Ref | | Ref | | |
| Black, non-Hispanic | 132 | 11 | 19 | 10 | 0.86 | 0.52, 1.43 | 0.99 | 0.56, 1.77 | | |
| Other, non-Hispanic | 59 | 5 | 9 | 5 | 0.91 | 0.44, 1.88 | 1.30 | 0.59, 2.86 | | |
| Hispanic | 63 | 5 | 18 | 9 | 1.71 | 0.98, 2.97 | 1.55 | 0.81, 2.97 | | |
| Marital status^b | | | | | | | | | | |
| Never married, single unspecified | 628 | 54 | 86 | 43 | Ref | Ref | | Ref | | |
| Married | 319 | 27 | 65 | 33 | 1.49 | 1.05, 2.11 | 1.51 | 0.99, 2.31 | | |
| Divorced | 174 | 15 | 37 | 19 | 1.55 | 1.02, 2.36 | 1.68 | 1.02, 2.74 | | |
| Married but separated | 31 | 3 | 4 | 2 | 0.94 | 0.32, 2.73 | 1.03 | 0.32, 3.35 | | |
| Widowed | 5 | 0 | 2 | 1 | 2.92 | 0.56, 15.29 | 3.72 | 0.64, 21.60 | | |
| Incident characteristics | | | | | | | | | | |
| Location of death | | | | | | | | | | |
| Died outside of home | 418 | 36 | 61 | 31 | Ref | Ref | | Ref | | |
| Died at home | 746 | 64 | 137 | 69 | 1.26 | 0.91, 1.74 | 1.11 | 0.76, 1.63 | | |
| Method^b | | | | | | | | | | |
| Firearm | 712 | 61 | 122 | 62 | 1.02 | 0.75, 1.39 | 1.37 | 0.53, 3.57 | | |
| Sharp instrument | 14 | 1 | 4 | 2 | 1.69 | 0.55, 5.20 | 2.93 | 0.63, 13.57 | | |
| Poisoning | 117 | 10 | 17 | 9 | 0.84 | 0.49, 1.43 | 0.92 | 0.31, 2.75 | | |
| Hanging | 278 | 24 | 47 | 24 | 0.99 | 0.70, 1.41 | 1.39 | 0.51, 3.78 | | |
| Circumstances | | | | | | | | | | |

| | No PTSD (<i>n</i> = 1,164) | | PTSD (<i>n</i> = 198) | | | | | | |
|---|-----------------------------|----|------------------------|----|-------|-------------|-------|-------------|--|
| | N | % | N | % | OR | 95% CI | aOR | 95% CI | |
| Health related ^c | | | | | | | | | |
| Current depressed mood | 424 | 36 | 75 | 38 | 1.06 | 0.78, 1.45 | 0.88 | 0.60, 1.27 | |
| Diagnosis of depression | 275 | 24 | 73 | 37 | 1.89 | 1.37, 2.60 | 1.75 | 1.21, 2.55 | |
| Alcohol dependence, or suspected intoxication | 444 | 38 | 92 | 46 | 1.41 | 1.03, 1.91 | 1.13 | 0.79, 1.61 | |
| Other substance abuse | 189 | 16 | 42 | 21 | 1.39 | 0.95, 2.02 | 1.34 | 0.87, 2.07 | |
| Life stress ^c | | | | | | | | | |
| Intimate partner problems | 560 | 48 | 89 | 45 | 0.88 | 0.65, 1.19 | 0.80 | 0.55, 1.17 | |
| Other relationship problems | 117 | 10 | 9 | 5 | 0.43 | 0.21, 0.85 | 0.48 | 0.22, 1.03 | |
| Criminal and civil legal problems | 174 | 15 | 24 | 12 | 0.78 | 0.50, 1.24 | 0.88 | 0.52, 1.49 | |
| Job problems | 200 | 17 | 32 | 16 | 0.93 | 0.62, 1.40 | 0.84 | 0.51, 1.39 | |
| Financial problems | 131 | 11 | 23 | 12 | 1.04 | 0.65, 1.66 | 0.90 | 0.51, 1.58 | |
| Recent crisis | 290 | 25 | 28 | 14 | 0.50 | 0.33, 0.76 | 0.56 | 0.34, 0.90 | |
| Deployment mentioned in narrative | 43 | 4 | 64 | 32 | 12.45 | 8.13, 19.06 | 14.53 | 9.03, 23.39 | |
| Other preceding circumstances ^c | | | | | | | | | |
| Disclosed intent | 332 | 29 | 66 | 33 | 1.25 | 0.91, 1.73 | 1.17 | 0.81, 1.70 | |
| Left a note | 339 | 29 | 52 | 26 | 0.87 | 0.62, 1.22 | 0.88 | 0.60, 1.28 | |

^a Adjusted for: race/ethnicity, marital status, age group, and all other circumstances.

^b Categories might not sum to total because of missing data.

^c Categories not mutually exclusive.