Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

HHS Public Access

Author manuscript

Psychol Trauma. Author manuscript; available in PMC 2017 September 01.

Published in final edited form as:

Psychol Trauma. 2016 September ; 8(5): 626–633. doi:10.1037/tra0000085.

Firing a Weapon and Killing In Combat Are Associated with Suicidal Ideation in OEF/OIF Veterans

Jessica C. Tripp, **Meghan E. McDevitt-Murphy**, and **Aisling V. Henschel**

The University of Memphis

Abstract

Objective—Combat veterans are at risk for several adverse outcomes such as posttraumatic stress disorder (PTSD), depression, hazardous alcohol use, and most critically, suicidal behaviors. The high rate of suicide in veterans has been understood as a correlate of PTSD and depression, but it is possible that certain specific types of combat experiences may lead to suicidal behaviors. Acts committed by the veteran in the context of war such as killing may evoke a "moral injury," which leads to thoughts of ending one's life.

Method—The present exploratory research examined relationships between combat experiences and suicidal ideation (SI) and PTSD in a sample of 68 OEF/OIF veterans (91% male, mean age = 32.31 years) who had screened positive for alcohol misuse. We examined firing a weapon/killing in combat (Firing/Killing) and killing in combat (Killing) alone as predictors of (SI) and PTSD severity in both the full sample, and in analyses that examined men only.

Results—Firing/Killing were associated with SI for the full sample and men only, and Killing showed a trend towards significance in predicting SI. Hierarchical regression analyses suggested that Firing/Killing did not predict PTSD for the full sample or men only, but Killing was predictive of PTSD for both samples.

Conclusions—These results indicate that there may be differences in Firing/Killing and Killing alone in OEF/OIF veterans who screened positive for alcohol misuse. Thorough screening of combat experiences and addressing moral injury in returning combat veterans may help reduce high rates of suicide and PTSD.

Keywords

PTSD; firing a weapon; killing in combat; suicidal ideation; moral injury

Suicide is one of the leading causes of preventable deaths in the United States, and military personnel and veterans may be particularly at risk for suicide and suicidal behaviors. In fact, suicide is the third leading cause of death among military personnel (Shively, 2010). A large epidemiological study found that the suicide rate was 66% higher among patients of Veterans Health Administration facilities compared to the general population (McCarthy et

Correspondence concerning this article should be addressed to Meghan McDevitt-Murphy, Department of Psychology, The University of Memphis, 202 Psychology Building, Memphis, TN 38152. mmcdvttm@memphis.edu.

Jessica C. Tripp, Department of Psychology, The University of Memphis and Memphis Veterans Affairs Medical Center; Meghan E. McDevitt-Murphy, Department of Psychology, The University of Memphis and Memphis Veterans Affairs Medical Center; Aisling V. Henschel, The University of Memphis and Memphis Veterans Affairs Medical Center.

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

al., 2009). Furthermore, in a report by the Department of Veterans Affairs (2013), veterans accounted for about 22.2% of all suicides in the United States during their study's timeframe although veterans only accounted for about 7.4% of the overall population. This report also estimated that 22 veterans committed suicide every day in the year 2010 (Department of Veterans Affairs, 2013). Due to the higher rate of suicide for veterans compared to the general population, recent research has focused on risk and protective factors for suicide among veterans.

There are various reasons why veterans may be at higher risk for suicide, and one is that veterans have high rates of mental illness, particularly depression and posttraumatic stress disorder (PTSD), both of which have been linked to a suicide risk (Pompeli et al., 2013; Smith et al., 2013). It is clear that there is a relationship between combat exposure and PTSD (Maguen et al., 2010; Rice & Sher, 2013; Van Winkle & Safer, 2011). There is also ample evidence that PTSD and other diagnoses increase risk of suicidality (Ilgen et al., 2012). Connor et al.'s (2013) examination of almost 3 million veterans found that almost half of individuals who died by suicide were diagnosed with one or more mental disorders, with depression being the most frequent diagnosis (30.7% of suicides), followed by several other disorders including PTSD (11.7% of suicides).

Recent attention has been brought to the connection between combat experiences and suicidality; for example, one study found that witnessing wartime atrocities is associated to current suicidal ideation (SI; Sareen et al., 2007). In a study of OEF/OIF veterans, Pietrzak et al. (2010) found that respondents who endorsed SI were more likely to score higher on measures of combat exposure.

In addition to general combat experiences that veterans experience, a small but growing body of evidence suggests that committing acts of war, such as killing enemy combatants, may be particularly traumatic and lead to suicidal behaviors. Previous literature has studied specific war-related injury and PTSD symptomatology, although fewer studies have examined the impact of these experiences on suicidality. Fontana, Rosenheck, and Brett (1992) also found an association between suicide attempts and killing or failing to prevent death in a sample of Vietnam theatre veterans. Another study of Vietnam veterans found that a higher number of experiences killing in combat (including enemies, prisoners, civilians, and also direct involvement in injuring/killing women, children, or elderly) was associated with twice the odds of SI relative to those with fewer killing experiences even after controlling for PTSD (Maguen, 2012). These findings suggest that there may be particular reasons that taking another individual's life leads one to contemplate ending their own life, even apart from trauma-related symptoms.

Suicide is a difficult behavior to predict even in populations at risk. In a study examining predictors of death by suicide, 1,906 inpatients with affective disorders, the number of prior attempts, SI at admission, bipolar disorder, outcome after discharge, and unipolar depressive disorder failed to identify any of the 46 individuals who died by suicide (Goldstein, Black, Nasrallah, & Winokur, 1991). Although one important precursor of suicide attempts is suicidal ideation (SI; Baca-Garcia et al., 2011; Brown, Beck, Steer, & Grisham, 2000; ten Have et al., 2009; Wenzel et al., 2011), SI alone reflects the low end of the severity

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

spectrum. It is important to note that SI with intent is a strong predictor of eventual death by suicide (Suominen, Isometsä, Ostamo, & Lönnqvist, 2004), and it may be a better predictor of death by suicide than SI without intent. A history of suicide attempts is one of the most salient predictors of a future death by suicide (Moşcicki, 1997). In addition to one's experience with past attempts and with ideation and intent, it is important to understand other correlates of SI, as it may help clinicians identify those at risk of suicidal behaviors.

Returning OEF/OIF veterans may also be at risk for alcohol misuse compared to non-OEF/OIF veterans (Hawkins, Lapham, Kivlahan, & Bradley, 2010; McDevitt-Murphy et al., 2010). Within the veteran population, alcohol misuse is associated with higher levels of suicidality and suicide attempts (Ilgen, Harris, Moos, & Tiet, 2007; Pietrzak et al., 2010). Past research has found that killing in combat may lead to alcohol misuse (Maguen et al., 2010), and there is also a large literature linking alcohol misuse to suicide risk in diverse populations (Boenisch et al., 2010; Bohnert, Roeder, & Ilgen, 2011; Lejoyeux et al., 2011). It is likely that alcohol use exacerbates depressive symptoms and may also lead to disinhibition, leading to impulsive behaviors such as suicidal acts. It is important to better understand the factors that may lead to and exacerbate SI. Despite this association, it is important to understand whether other factors may be contributing to SI among combat veterans above and beyond alcohol misuse.

Differences may exist between men and women regarding SI and suicidal behaviors, although there is a dearth of literature that examines this in veteran populations. Both male and female veterans have shown higher rates of death by suicide than in the general population (McCarthy et al., 2009). A large-scale study found that within active duty Air Force personnel, the rates of past-year suicidal ideation was 3% and 5.5%, among men and women respectively (Snarr, Heyman, & Slep, 2010). Overall, men are more likely to die by suicide, although women are more likely to attempt suicide by means that are not fatal (Canetto & Sakinofsky, 1998).

The present exploratory study examined relationships between a range of different combat experiences and symptoms of both PTSD and depression, with a particular focus on SI. Our sample consisted of OEF/OIF veterans recruited to participate in an alcohol intervention (McDevitt-Murphy et al., 2014). We hypothesized those veterans who fired a weapon or killed in combat would be more likely to endorse past 2-week SI and have higher levels of PTSD and depression, after adjusting for potential covariates.

Method

Participants

Participants were 68 OEF/OIF veterans recruited from Veterans Affairs Medical Center (VAMC) clinics for an alcohol intervention study. A majority of these were recruited from dedicated "combat clinics," which served OEF/OIF veterans presenting to the VAMC for the first time. Others were recruited through advertisements posted in the VAMC. Participants were predominantly male (n = 62, 91.0%), and ranged in age from 20 to 53 (M = 32.31, SD = 8.84). The sample was ethnically diverse, with 65% identifying as Caucasian (n = 44), 28% identifying as African American (n = 19), 6% identifying as multi-ethnic (n = 4), and

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

1% (*n* = 1) identifying as Asian. The majority of the sample had some college education (*n* = 24; 35%) or a high school diploma/GED (*n* = 23; 34%) as the highest level of education received. All participants had been deployed as part of OEF/OIF, the average total months deployed was 14.93 (*SD* = 8.57), and they reported an average of 1.49 (*SD* = .70) total deployments. All participants had screened positive for hazardous alcohol use on a version of the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993).

Procedure

Although this investigation used data from a study of heavy drinkers receiving a brief intervention, all data came from the baseline (pre-intervention) assessment. All individuals gave informed consent before participating. The Institutional Review Boards of The University of Memphis and the Memphis VAMC approved all procedures.

Measures

Combat Exposure—The Deployment Risk and Resilience Inventory (DRRI; King et al., 2006) is a 201-item self-report measure that assesses 14 different aspects related to combat experiences (e.g. conditions during deployment, social support upon returning, etc.). The Combat Experiences scale contains 15 dichotomous items that assess exposure to certain experiences in combat, and scores may range from 0 to 15 on the scale. Sample items include “I or members of my unit were attacked by terrorists or civilians,” “My unit engaged in battle in which it suffered causalities,” “I fired my weapon at the enemy,” and “I killed or think I killed someone in combat.” The DRRI has been validated across different veteran populations, and the Combat Experiences Scale has shown excellent internal consistency (α = .85) in both OIF and Gulf War veterans (Vogt et al., 2008). This measure demonstrated excellent internal consistency (α = .90).

Combat Related PTSD—The Clinician Administered PTSD Scale (CAPS: Blake et al., 1990) assesses past month PTSD symptoms related to combat based on the DSM-IV conceptualization of PTSD. A trained interviewer assessed the frequency (0 = *Never* to *Daily or* 4 = *Almost every day*) and intensity (0 = *None* to 4 = *Extreme*) of each symptom. The sum of the scores across all frequency and intensity items reflects a score for total PTSD severity, which ranges from 0 to 136. The CAPS demonstrated good internal consistency (α > .85 to α > .87) for symptom clusters with a total alpha score of .94 in a sample of veterans. Inter-rater test-retest reliability was strong (*r* > .77 to *r* > .96) for symptom clusters and for all 17 items (*r* > .90 to *r* > .98; Blake et al., 1995). Internal consistency was excellent in this sample (α = .94).

Depression—The Beck Depression Inventory-II (BDI; Beck, Steer, & Brown, 1996) is a 21-item measure that assesses different symptoms of depression on a 0 to 3 scale. The scale has one item that measures suicidal ideation (0 = *I don’t have any thoughts of killing myself*; 1 = *I have thoughts of killing myself, but I would not carry them out*; 2 = *I would like to kill myself*; 3 = *I would kill myself if I had the chance*. The BDI-II has been validated among samples of college student populations by exhibiting high internal consistency (α > .89). The BDI-II suicide item has shown strong associations with first five items of the Scale for

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

Suicide Ideation (SSI; Beck et al., 1979) that are intended to screen for SI, providing evidence that SI may be measured validly with a scale that typically measures overall generalized depression (Desseilles et al., 2012). For analyses, we calculated a BDI composite score that excluded the SI item and we also examined the single item focusing on SI. Internal consistency for this measure in our sample was excellent ($\alpha = .94$).

Alcohol Misuse—The Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993) is a 10-item measure that is used to screen for alcohol use disorders. The measure assesses three domains of alcohol use: hazardous alcohol use, dependence symptoms, and harmful alcohol use. All questions on the AUDIT assess current and past year alcohol misuse, and a sample item from this measure includes “How often during the last year have you had a feeling of guilt or remorse after drinking?”

Alcohol Use—The Timeline Follow Back (TLFB; Sobell & Sobell, 1996) is a calendar-based assessment method used to obtain participant’s report of the number of standard drinks consumed on each day for the past 30 days. A variety of variables may be obtained from this measure, and for the present study we examined drinks per week and averages drinks consumed during each day one spent drinking.

Data Analysis Plan

We first examined bivariate relationships between types of combat experiences, PTSD and depression severity, and SI. We next created a composite score of firing a weapon and killing an enemy (Firing/Killing) to determine if it predicted SI and PTSD after adjusting for potential covariates. We also examined killing in combat (Killing) alone as a predictor of SI and PTSD. We also examined several demographic and alcohol misuse and use variables in relation to both dependent variables (SI and CAPS severity), including ethnicity, age, gender, AUDIT score, drinks per drinking day, and drinks per week (derived from the Time Line Follow Back) to determine if they should be included in the regression models as covariates. Next, we conducted a t-test to determine if there were significant differences in CAPS severity between those who fired/killing and those who did not; a similar t-test was run for Killing.

Last, we ran a multiple hierarchical regression that examined Firing/Killing and Killing as predictors of CAPS severity after adjusting for other types of combat experiences. We examined both the logistic regression and linear regression in the full sample, and in men only to determine if there may be sex differences in these relationships. Mean substitution was used to handle missing data for any measure that was 80% or more complete. Any dichotomous variables that were missing were excluded from analyses, with the exception of the Firing/Killing variable. Any answer of “yes” on either of the items, even with an incomplete answer on the other was coded as “yes” to the composite variable. There were no individuals who answered “no” on one item with the other item missing, therefore any missing data on the Firing/Killing variable was for participants who left both items blank. Any individual who did not answer the Killing item was excluded from analyses.

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

Results

Descriptive statistics

Participants were 68 OEF/OIF veterans recruited from Veterans Affairs Medical Center (VAMC) sites. Table 1 lists descriptive statistics for the sample on levels of combat exposure, frequency of SI, CAPS severity, BDI severity (excluding the suicide item), and alcohol-related scores. Of the individuals who reported any SI within the past two weeks, all reported thoughts of killing themselves but that they would not carry them out. Therefore, there were no veterans in this sample who expressed more severe SI (as indicated by a score of 2 or 3 on BDI-II item querying suicidality). Therefore the suicide item was essentially dichotomous and distinguished those with no thoughts of harming themselves and those with thoughts of harming themselves with no intention of carrying it out. There were 39 (57.4%) veterans who reported firing a weapon at someone, and 26 (38.2%) reported that they killed or believed they killed someone in combat. Thirty-nine (57%) veterans met CAPS criteria for PTSD using the F1/I2 scoring rule which designates symptoms as "present" when rated with a frequency score of at least 1 and an intensity score of at least 2 and assigns a diagnosis of PTSD if present symptoms meet the DSM-IV criteria. Thirty-one (46%) met criteria for depression according to a score of 20 or higher on the BDI-II. It is interesting to note that there were 5 veterans who responded to the item asking about firing a weapon but did not answer the question about killing someone in combat, which is the subsequent question on the DRRI. All 5 of these veterans who did not respond to killing in combat did respond "yes" to firing a weapon at the enemy and were therefore included in any analyses using the Firing/Killing variable.

The average AUDIT score was 13.48 (SD = 5.94) and the average number of drinks consumed per week was 18.83 (SD = 24.67). It is important to note that several individuals did not report current heavy drinking, as it is possible to screen positive on the AUDIT without engaging in current drinking.

Combat exposure, PTSD, and SI

First, we examined relationships between a range of combat experiences, CAPS severity, depression severity, and SI (shown in Table 2). We found that the items: "I fired my weapon at the enemy" and "I killed or think I killed someone in combat" were significantly associated with SI on the BDI, and both of these combat items were moderately associated with CAPS total severity. Several combat related experiences were significantly associated with CAPS total severity, and those that had the strongest associations were: *taking part in an assault on entrenched or fortified positions*, *witnessing enemy soldiers be seriously wounded or killed*, and *killing or believing one killed an enemy soldier*. To determine how specific types of combat correlated with depression severity outside of suicidal ideation, we calculated a BDI score that excluded the suicide item. We conducted correlation analyses with both the total BDI score that include SI and a BDI score that excluded SI, and we found that significant associations between combat experiences and depression severity were consistent across both scores. Therefore, we chose to report BDI score excluding the suicide item to show associations between combat and depression outside of suicidal ideation. Three types of combat exposure were significantly associated with BDI severity after excluding the

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

suicide item, and these included: *receiving "friendly" incoming fire* ($r = .39$, $p < .001$), *being part of a unit that fired on the enemy* ($r = .35$, $p < .01$), and *taking part in an assault on entrenched or fortified positions*, ($r = .33$, $p < .01$).

We next created a composite variable that combined "I fired my weapon at the enemy" and "I killed or think I killed someone in combat," (which we will refer to as "Firing/Killing") as these two items are closely related. We reasoned that firing a weapon at the enemy reflects an intent to kill or the belief that one may kill the individual. Empirically, we found that these two items were strongly correlated ($r = .77$, $p < .001$). The composite variable was scored dichotomously, with a score of 1 indicating endorsement of at least one of the contributing items. We examined relationships between race, age, sex, AUDIT score, drinks per drinking day, and drinks per week with SI and CAPS severity to determine if there were any covariates that should be included to the regression models. CAPS severity was significantly correlated with AUDIT total ($r = .56$, $p < .001$); there were also significant differences between Caucasian ($M = 48.04$, $SD = 29.09$) and African American individuals in CAPS severity ($M = 60.89$, $SD = 19.21$, $t(50.4) = -2.08$, $p < .05$). Therefore, AUDIT score and race were included as covariates in the model predicting CAPS severity. We conducted a logistic regression to determine if this composite variable predicted suicidal ideation after controlling for other types of combat experiences (Table 3). We found that the composite "Firing/Killing" variable was in fact predictive of SI after controlling for other types of combat experiences.

Because there may be differences in firing a weapon and killing in combat, we conducted a logistic regression to determine if killing in combat alone predicted suicidal ideation after adjusting for other types of combat experiences (Table 3). We found that there was a trend towards significance, in that killing in combat approached significance in predicting SI after adjusting for other types of combat. We conducted this same analysis with men only (as we did not have a large enough sample to conduct this analysis in women) to determine if there are possible sex differences. We found similar results in that there was a trend towards significance for men only in killing in combat predicting SI (Table 4).

We next conducted an independent samples t-test to compare CAPS severity between those who did and did not endorse Firing/Killing and Killing variables. Veterans who obtained a score of 1 on Firing/Killing combat had a significantly higher mean CAPS score ($M = 59.41$, $SD = 27.00$) than those with a score of 0 ($M = 38.79$, $SD = 21.23$, $t(65) = -3.36$, $p < .01$). Veterans who obtained a score of 1 on Killing had a significantly higher mean CAPS score ($M = 62.54$, $SD = 24.76$) than those with a score of 0 ($M = 40.14$, $SD = 21.89$, $t(60) = -3.76$, $p < .001$). We next conducted several hierarchical multiple regressions to determine if Firing/Killing and Killing predicted CAPS severity after controlling for AUDIT score and other types of combat exposure (Table 4). We found that Firing/Killing was not predictive of CAPS for the full sample and men only, but killing in combat predicted CAPS severity, for the full sample and men only (Table 4).

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

Discussion

This exploratory study investigated predictors of suicidal ideation in a sample of OEF/OIF veterans who endorsed past-year hazardous drinking. As predicted, most of the specific combat experiences we examined were associated with PTSD severity. Taking part in an assault on entrenched or fortified positions, witnessing enemy soldiers being seriously wounded or killed, and killing or believing one killed an enemy were the experiences most strongly associated with PTSD severity. Combat experiences were less strongly correlated with depression severity after excluding the suicide item. There were only 3 specific combat experiences that were significantly correlated with depression severity: receiving “friendly” incoming fire, being part of a unit that fired on the enemy, and taking part in an assault on entrenched or fortified position. Only two types of combat experiences were associated with SI: killing or believing one killed the enemy and firing a weapon at the enemy. These findings underscore the detrimental impact of attempting to harm or killing on one’s own psychological health. Also it appears that firing one’s weapon, irrespective of whether this results in a death, may be just as psychologically damaging.

We found that Firing/Killing predicted SI, even after adjusting for other types of combat experiences, for both the full sample and men only. Interestingly, killing in combat alone showed a trend towards significance in predicting SI; it is difficult to understand whether the five individuals who did not respond to the killing item did so because they had killed in combat and were uncomfortable reporting this. Whether or not that is the case, these findings provide evidence that there is something unique about attempting to harm another human, or actually killing that may lead to SI above and beyond other types of combat. Our findings resonate with the construct of “moral injury,” which has been described as “perpetrating, failing to prevent, bearing witness to, or learning about acts that transgress deeply held moral beliefs and expectations” (Litz et al., 2009, p. 1), a definition which would include attempting to kill or believing one has killed another human being. The present findings seem to fit within this construct and suggest that moral injury may have severe consequences such as elevated PTSD and depression severity, and in the most extreme cases, thoughts of killing oneself.

We also found that Firing/Killing was not associated with higher rates of PTSD after adjusting for covariates for the full sample or men only. Interestingly, killing (or thinking one killed) was significantly associated with PTSD severity, even after adjusting for other covariates. Our results are somewhat consistent with past research that found significant associations between attempting to kill or actually killing and PTSD, and that these two variables were predictive of PTSD above and beyond witnessing combat trauma (Pitts et al., 2014). Our overall results are somewhat contradictory, in that Firing/Killing was associated with SI but not PTSD, while Killing was not associated with SI but was associated with PTSD. It is possible that we did not find significant associations between Killing and SI because individuals did not want to answer the question about killing another human. This item follows directly after the item about firing a weapon, and this alone indicates that there may be some hesitancy in admitting to killing another human. Although we did not have a large enough number of women to determine if there were sex differences in these results,

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

we did find similar results for the full sample and men only, suggesting that sex differences may not exist in these findings.

This study has potential clinical implications. First, this research provides evidence that it is imperative to assess combat experiences in returning veterans. Also meaningful is a thorough and immediate assessment of veterans' beliefs, feelings, and reactions to these events, which may help clinicians better target resulting psychopathology. Because alcohol use causes individuals to be at higher risk for suicidal behaviors (Ilgen et al., 2007), the first step in treatment for veterans who are heavily drinking after combat may be attempting to reduce and moderate alcohol consumption. Another important topic in potentially reducing suicidal thoughts and behaviors is moral injury that has occurred as a result of harming others. It is possible that our findings are specific to individuals who have experienced recent alcohol misuse, although it is possible that these types of combat behaviors and subsequent moral injury are partially what lead to alcohol misuse.

This study has some limitations that warrant mention. First, our sample was comprised of veterans who had screened positive for alcohol misuse, and the extent to which this pattern of results might generalize to the broader veteran population is unclear. Killing in combat has been shown to predict post-deployment PTSD and alcohol misuse (Maguen et al., 2010), so it is a limitation that we did not include individuals without alcohol misuse in our study and those who may have a less severe presentation overall. Despite this limitation, it is important to understand how combat experiences may affect those who present with more problems and are more likely to seek psychological services. Further, our sample demonstrated some variability in alcohol consumption and showed significantly lower scores on the AUDIT ($M = 13.48$) compared to other alcohol treatment seeking samples (e.g. $M = 23.40$; Pal, Jena, & Yaday, 2004).

Second, and most importantly, our assessment of SI was incomplete. As we used a one-item measure of SI that did not capture suicidal behaviors or attempts, it is difficult to determine how the constructs at hand may relate to suicide attempts or death by suicide. SI does seem to be a necessary step along the path to suicide, however it is far more common than suicide attempts or death by suicide; therefore its utility as a proxy of suicidal behavior is limited, although we believe it is still meaningful. While the sample size was large enough to provide power for the analyses conducted, future studies should examine these variables in a larger sample to ensure the consistency of these results. The sample was also mostly comprised of men so these findings may not generalize to women, and future research should attempt to oversample female veterans or do a study with female veterans only to determine if these findings are consistent in women. We attempted to conduct our main analyses on the full sample and men only to determine if there may have been unique findings specific to men only, although we did not find largely different results.

Future research should also examine these constructs within a more general population of veterans not recruited from the VA and those who abstain from alcohol, therefore providing the ability to generalize to those who do not use VA services or use alcohol. Further, future studies should utilize a more thorough assessment of suicidal behavior in examining the effects of specific combat experiences. It would also be beneficial to examine the

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

implications of combat exposure and psychopathology on suicidal behaviors longitudinally to determine if the effects are enduring. Despite these important methodological implications, we believe these findings will add to the literature in beginning to better the complex relationships between combat experiences, psychological responses, and suicidal behavior.

Acknowledgments

This research was supported by a grant from the National Institute of Alcohol Abuse and Alcoholism: K23 AA 016120-01.

References

American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4. Washington, DC: Author; 2001. Text Revision

Baca-Garcia E, Perez-Rodriguez M, Oquendo MA, Keyes KM, Hasin DS, Grant BF, Blanco C. Estimating risk for suicide attempt: Are we asking the right questions?: Passive suicidal ideation as a marker for suicidal behavior. Journal of Affective Disorders. 2011; 134(1–3):327–332. DOI: 10.1016/j.jad.2011.06.026 [PubMed: 21784532]

Beck AT, Kovacs M, Weissman A. Assessment of suicidal intention: the Scale for Suicide Ideation. Journal of Consulting and Clinical Psychology. 1979; 47:343–352. [PubMed: 469082]

Beck, AT.; Steer, RA.; Brown, GK. Manual for the Beck Depression Inventory. 2. San Antonio, TX: Psychological Corporation; 1996.

Blake, D.; Weathers, F.; Nagy, L.; Kaloupek, D.; Klauminzer, G.; Charney, D.; Keane, T. Clinician-administered PTSD scale (CAPS). Boston, MA: National Center for Post-Traumatic Stress Disorder, Behavioral Science Division; 1990.

Blake DD, Weathers FW, Nagy LM, Kaloupek DG, Gusman FD, Charney DS, Keane TM. The development of a clinician-administered PTSD scale. Journal of Traumatic Stress. 1995; 8:75–90. [PubMed: 7712061]

Boenisch SS, Bramesfeld AA, Mergl RR, Havers II, Althaus DD, Lehfeld HH, … Hegerl UU. The role of alcohol use disorder and alcohol consumption in suicide attempts—A secondary analysis of 1921 suicide attempts. European Psychiatry. 2010; 25:7–420. DOI: 10.1016/j.eurpsy.2009.11.007

Bohnert AB, Roeder KM, Ilgen MA. Suicide attempts and overdoses among adults entering addictions treatment: Comparing correlates in a U.S. National study. Drug and Alcohol Dependence. 2011; 119(1–2):106–112. DOI: 10.1016/j.drugalcdep.2011.05.032 [PubMed: 21715108]

Brown GK, Beck AT, Steer RA, Grisham JR. Risk factors for suicide in psychiatric outpatients: A 20-year prospective study. Journal of Consulting and Clinical Psychology. 2000; 68(3):371–377. DOI: 10.1037/0022-006X.68.3.371 [PubMed: 10883553]

Canetto SS, Sakinofsky I. The gender paradox in suicide. Suicide and Life-Threatening Behavior. 1998; 28(1):1–23. [PubMed: 9560163]

Conner KR, Bohnert AS, McCarthy JF, Valenstein M, Bossarte R, Ignacio R, Naiji L, Ilgen MA. Mental disorder comorbidity and suicide among 2.96 million men receiving care in the veterans health administration health system. Journal of Abnormal Psychology. 2013; 122(1):256–263. DOI: 10.1037/a0030163 [PubMed: 23088376]

Department of Veterans Affairs, Mental Health Services, Suicide Prevention Program. Suicide Data Report, 2012. 2013. Retrieved from http://www.va.gov/opa/docs/Suicide-Data-Report-2012-final.pdf

Desseilles M, Perroud N, Guillaume S, Jaussent I, Genty C, Malafosse A, Courtet P. Is it valid to measure suicidal ideation by depression rating scales? Journal of Affective Disorders. 2012; 136(3):398–404. DOI: 10.1016/j.jad.2011.11.013 [PubMed: 22154567]

Fontana A, Rosenheck R, Brett E. War zone traumas and posttraumatic stress disorder symptomatology. Journal of Nervous and Mental Disease. 1992; 180:748–755. [PubMed: 1469372]

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

Goldstein RB, Black DW, Nasrallah A, Winokur G. The prediction of suicide: Sensitivity, specificity, and predictive value of a multivariate model applied to suicide among 1906 patients with affective disorders. Archives of General Psychiatry. 1991; 48(5):418–422. DOI: 10.1001/archpsyc.1991.01810290030004 [PubMed: 2021294]

Hawkins EJ, Lapham GT, Kivlahan DR, Bradley KA. Recognition and management of alcohol misuse in OEF/OIF and other veterans in the VA: A cross-sectional study. Drug and Alcohol Dependence. 2010; 109(1–3):147–153. DOI: 10.1016/j.drugalcdep.2009.12.025 [PubMed: 20167440]

Ilgen MA, Harris AS, Moos RH, Tiet QQ. Predictors of a suicide attempt one year after entry into substance use disorder treatment. Alcoholism: Clinical And Experimental Research. 2007; 31(4):635–642.

Ilgen MA, McCarthy JF, Ignacio RV, Bohnert AB, Valenstein M, Blow FC, Katz IR. Psychopathology, Iraq and Afghanistan service, and suicide among Veterans Health Administration patients. Journal of Consulting and Clinical Psychology. 2012; 80(3):323–330. DOI: 10.1037/a0028266 [PubMed: 22545742]

King LA, King DW, Vogt DS, Knight J, Samper RE. Deployment risk and resilience inventory: A collection of measures for studying deployment-related experiences of military personnel and veterans. Military Psychology. 2006; 18:89–120. DOI: 10.1207/s15327876mp1802_1

Lejoyeux M, Gastal D, Bergeret A, Casalino E, Lequen V, Guillermet S. Alcohol use disorders among patients examined in emergency departments after a suicide attempt. European Addiction Research. 2011; 18(1):26–33. DOI: 10.1159/000332233 [PubMed: 22156705]

Litz BT, Stein N, Delaney E, Lebowitz L, Nash WP, Silva C, Maguen S. Moral injury and moral repair in war veterans: A preliminary model and intervention strategy. Clinical Psychology Review. 2009; 29(8):695–706. DOI: 10.1016/j.cpr.2009.07.003 [PubMed: 19683376]

Maguen S, Lucenko BA, Reger MA, Gahm GA, Litz BT, Seal KH, … Marmar CR. The impact of reported direct and indirect killing on mental health symptoms in Iraq War veterans. Journal of Traumatic Stress. 2010; 23(1):86–90. [PubMed: 20104592]

Maguen S, Metzler TJ, Bosch J, Marmar CR, Knight SJ, Neylan TC. Killing in combat may be independently associated with suicidal ideation. Depression and Anxiety. 2012; 29(11):918–923. DOI: 10.1002/da.21954 [PubMed: 22505038]

McCarthy JF, Valenstein M, Kim HM, Ilgen M, Zivin K, Blow F. Suicide mortality among patients receiving care in the Veterans Health Administration health system. American Journal of Epidemiology. 2009; 169:1033–1038. DOI: 10.1093/aje/kwp010 [PubMed: 19251753]

McDevitt-Murphy ME, Murphy JG, Williams JL, Monahan CJ, Bracken-Minor KL, Fields JA. Randomized controlled trial of two brief alcohol interventions for OEF/OIF veterans. Journal Of Consulting And Clinical Psychology. 2014; 82(4):562–568. DOI: 10.1037/a0036714 [PubMed: 24773573]

McDevitt-Murphy ME, Williams JL, Bracken KL, Fields JA, Monahan CJ, Murphy JG. PTSD symptoms, hazardous drinking, and health functioning among U.S. OEF and OIF veterans presenting to primary care. Journal of Traumatic Stress. 2010; 23(1):108–111. [PubMed: 20104586]

Moşcicki EK. Identification of suicide risk factors using epidemiologic studies. Psychiatric Clinics of North America. 1997; 20(3):499–517. DOI: 10.1016/S0193-953X(05)70327-0 [PubMed: 9323310]

Pal HR, Jena R, Yadav D. Validation of the Alcohol Use Disorders Identification Test (AUDIT) in urban community outreach and de-addiction center samples in North India. Journal of Studies on Alcohol. 2004; 65(6):794–800. [PubMed: 15700518]

Pietrzak RH, Goldstein MB, Malley JC, Rivers AJ, Johnson DC, Southwick SM. Risk and protective factors associated with suicidal ideation in veterans of operations Enduring Freedom and Iraqi Freedom. Journal of Affective Disorders. 2010; 123(1–3):102–107. DOI: 10.1016/j.jad.2009.08.001 [PubMed: 19819559]

Pitts BL, Chapman P, Safer MA, Unwin B, Figley C, Russell DW. Killing versus witnessing trauma: Implications for the development of PTSD in combat medics. Military Psychology. 2014; 25(6):537–544. DOI: 10.1037/mil0000025

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

Pompili M, Sher L, Serafini G, Forte A, Innamorati M, Dominici G, … Girardi P. Posttraumatic stress disorder and suicide risk among veterans: A literature review. Journal of Nervous and Mental Disease. 2013; 201(9):802–812. DOI: 10.1097/NMD.0b013e3182a21458 [PubMed: 23995037]

Rice TR, Sher LL. Killing in combat and suicide risk. European Psychiatry. 2013; 28(4)doi: 10.1016/j.eurpsy.2012.10.001

Sareen J, Cox BJ, Afifi TO, Stein MB, Belik S, Meadows G, Asmundson GG. Combat and peacekeeping operations in relation to prevalence of mental disorders and perceived need for mental health care: Findings from a large representative sample of military personnel. Archives of General Psychiatry. 2007; 64(7):843–852. [PubMed: 17606818]

Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption: II. Addiction. 1993; 88:791–804. DOI: 10.1111/j.1360-0443.1993.tb02093.x [PubMed: 8329970]

Shively, LA. Suicide preventable, though third leading cause of death among Army personnel. 2010. Retrieved June 28, 2011, from http://www.army.mil/article/45632/suicide-preventable-through-third-leading-cause-of-death-among-army-personnel

Sobell, LC.; Sobell, MB. Timeline Followback user's guide: A calendar method for assessing alcohol and drug use. Toronto, Ontario, Canada: Addiction Research Foundation; 1996.

Smith EG, Kim H, Ganoczy D, Stano C, Pfeiffer PN, Valenstein M. Suicide risk assessment received prior to suicide death by veterans health administration patients with a history of depression. Journal of Clinical Psychiatry. 2013; 74(3):226–232. DOI: 10.4088/JCP.12m07853 [PubMed: 23561227]

Snarr JD, Heyman RE, Slep AMS. Recent suicidal ideation and suicide attempts in a large-scale survey of the U.S. Air Force: Prevalences and demographic risk factors. Suicide and Life-Threatening Behavior. 2010; 40:544–552. [PubMed: 21198323]

Steer RA, Clark DA. Psychometric characteristics of the Beck Depression Inventory-II with college students. Measurement and Evaluation in Counseling and Development. 1997; 30:128.

Suominen K, Isometsä E, Ostamo A, Lönnqvist J. Level of suicidal intent predicts overall mortality and suicide after attempted suicide: A 12-year follow-up study. BMC Psychiatry. 2004; 4doi: 10.1186/1471-244X-4-11

ten Have M, de Graaf R, van Dorsselaer S, Verdurmen J, van't Land H, Vollebergh W, Beekman A. Incidence and course of suicidal ideation and suicide attempts in the general population. The Canadian Psychiatric Association Journal. 2009; 54(12):824–833.

Van Winkle EP, Safer MA. Killing versus witnessing in combat trauma and reports of PTSD symptoms and domestic violence. Journal of Traumatic Stress. 2011; 24(1):107–110. [PubMed: 21351168]

Vogt DS, Proctor SP, King DW, King LA, Vasterling JJ. Validation of scales from the deployment risk and resilience inventory in a sample Operation Iraqi Freedon Veterans. Assessment. 2008; 15:391–403. DOI: 10.1177/1073191108316030 [PubMed: 18436857]

Wenzel A, Berchick ER, Tenhave T, Halberstadt S, Brown GK, Beck AT. Predictors of suicide relative to other deaths in patients with suicide attempts and suicide ideation: A 30-year prospective study. Journal of Affective Disorders. 2011; 132(3):375–382. DOI: 10.1016/j.jad.2011.03.006 [PubMed: 21481944]

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

Table 1

Descriptive Statistics on Combat Exposure, Suicidal Ideation, CAPS Severity, and BDI Severity for the Full Sample.

	Mean or %	Standard Deviation
Men	*n* = 61 (91%)	
Women	*n* = 7 (9%)	
Total months deployed	14.93	8.57
Years since returned from deployment	2.38	1.69
DRRI Combat Exposure total *	7.85	4.28
CAPS Severity **	51.22	26.67
Met criteria for PTSD	*n* = 39 (57%)	
BDI Severity ***	18.91	12.41
Met criteria for depression	*n* = 31 (46%)	
AUDIT severity	13.48	5.94
Average drinks per week	18.83	24.67

Note.

* DRRI (Deployment Risk and Resiliency) Combat Exposure ranges from 0 to 15.

** CAPS (Clinician Administered PTSD Scale) severity ranges from 0 to 136.

*** BDI (Beck Depression Inventory-II) Severity ranges from 0 to 63.

**** Suicidal Ideation reflects one item from the Beck Depression Inventory, which queries about suicidal ideation.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 2

Correlations between Suicidal Ideation, CAPS Severity, and BDI Severity with DRRI Combat Exposure Items for the Full Sample.

Type of Combat Exposure	Suicidal Ideation BDI	CAPS Severity	BDI Severity (excluding
I fired my weapon at enemy	.29*	.39**	.18
I killed or believe I killed someone	.25*	.44**	.19
I went on combat patrols or missions	.00	.17	.04
My unit engaged in battle which suffered causalities	.00	.17	.02
I witnessed someone from unit or ally be seriously wounded or killed	−.06	.27*	.11
I witnessed enemy soldiers be seriously wounded or killed	.08	.44**	.16
I was wounded or injured in combat	−.02	.34**	.10
I or member of my unit encountered land/water mines and/or booby traps	.00	.08	−.10
I or member of my unit received hostile incoming fire	.11	.00	−.10
I or member of my unit received “friendly” incoming fire	.00	.32**	.39***
I was in a vehicle that was under fire	.11	.28*	.09
I or members of my unit were attacked by terrorists or civilians	.08	.14	−.06
I was part of a land or unit that fired on the enemy	.19	.35**	.35**
I was part of an assault on entrenched or fortified positions	.07	.59**	.35**
I took part in an invasion that involved naval and/or land forces	−.01	.07	−.02

Note.

* $p < .05$;

** $p < .01$,

*** $p < .001$

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 3

Logistic Regression with Firing/Killing and Killing Predicting Suicidal Ideation after Adjusting for Other Types of Combat.

Full Sample (*n* = 64)				
Variable	***B***	***Wald X²***	**OR**	**95% C.I.**
Step 1				
Other Combat Experiences	*.04*	*.26*	1.04	.89 to 1.22
Step 2				
Fired/Killed	2.63	6.65*	13.87	1.88 to 102.35
Men only (*n* = 59)				
Variable	***B***	***Wald X²***	**OR**	**95% C.I.**
Step 1				
Other Combat Experiences	−.20	2.41	.82	.63 to 1.06
Step 2				
Fired/Killed	2.36	5.17*	10.75	1.39 to 83.37
Full sample (*n* = 62)				
Variable	***B***	***Wald X²***	**OR**	**95% C.I.**
Step 1				
Other Combat Experiences	−.08	.53	.92	.75 to 1.15
Step 2				
Killed in combat	1.60	3.18†	4.95	.85 to 28.76
Men only (*n* = 56)				
Variable	**B**	**Wald X2**	**OR**	**95% C.I.**
Step 1				
Other Combat Experiences	−.12	1.04	.89	.70 to 1.12
Step 2				
Killed in combat	1.74	3.33†	5.69	.88 to 36.79

Note.

*$p < .05$,

†$p = 05 - .10$

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

Table 4

Hierarchical Regression with Firing/Killing and Killing Predicting CAPS Severity after Adjusting for Alcohol Misuse, Race, and Other Types of Combat.

Full sample (*n* = 68) **Predictor**	**B**	**β**	**ΔR2**	**F**	**ΔF**
Step 1					
AUDIT total	.47	2.12***			
Race	.31	18.15**			
Other Combat Experiences	.37	2.70	.49	15.52***	15.52***
Step 2					
Fired/Killed	.22	11.56	.02	12.57***	2.39
Men only (*n* = 62) Predictor	B	β	ΔR2	F	ΔF
Step 1					
AUDIT total	.50	2.21***			
Race	.28	16.53*			
Other Combat Experiences	.39	3.00**	.54	17.23***	17.23***
Step 2					
Fired/Killed	.16	8.79	.01	13.33***	1.30
Full sample (*n* = 68) Predictor	B	β	ΔR^2	F	ΔF
Step 1					
AUDIT total	.47	2.11***			
Race	.35	20.10**			
Other Combat Experiences	.13	.84	.48	14.92***	14.92***
Step 2					
Killed in combat	.36	19.42*	.07	14.40***	7.14*
Men only (*n* = 62)	B	β	ΔR2	F	ΔF

Full sample (n = 68) Predictor	B	β	ΔR2	F	ΔF
Predictor					
Step 1					
AUDIT total	.51	2.21***			
Race	.32	19.34**			
Other Combat Experiences	.16	1.12	.53	15.78***	15.78***
Step 2					
Killed in combat	.36	19.11*	.07	15.25***	7.02*

Note.

*** $p < .001$,

** $p < .01$,

* $p < .05$

Author Manuscript Author Manuscript Author Manuscript Author Manuscript