BRIEF REPORT

The Influence of Combat and Interpersonal Trauma on PTSD, Depression, and Alcohol Misuse in U.S. Gulf War and OEF/OIF Women Veterans

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The present study evaluated the impact of combat and interpersonal trauma exposure in a sample of 115 U.S. women veterans from Gulf War I and the Iraq and Afghanistan wars on 3 postdeployment trauma-related mental health outcomes: posttraumatic stress disorder symptoms (PSS), depressive symptom severity (DSS), and alcohol misuse. Patients presenting for healthcare services at a Veterans Affairs postdeployment health specialty clinic completed screening questionnaires that assessed combat exposure, lifetime interpersonal trauma history of childhood neglect, physical, or sexual abuse, and adult sexual and physical assault. In a regression model, combat exposure was the only significant independent variable associated with PSS, DSS, and alcohol misuse (β = .42, .27 and B = 1.58, respectively) even after adding lifetime interpersonal assault exposure to the model. Results highlight the negative effects of combat exposure on treatment-seeking women veterans’ postdeployment mental health. Incorporating combat exposure into routine screening procedures for Gulf War and Iraq and Afghanistan war women veterans can aid in mental health treatment planning.

Women represent approximately 11%–14% of the United States military personnel serving in Afghanistan and Iraq combat operations (Department of Veterans Affairs, 2010). Roles for women within the military have expanded (e.g., Street, Vogt, & Dutra, 2009; Vogt et al., 2011) with estimates of combat exposure ranging from 4%–31% (Zinzow et al., 2007). In addition to combat, up to half of all women veterans have experienced other traumatic events (Zinzow et al., 2007), with women veterans more likely to experience sexual assault relative to civilians and male military counterparts (Schultz, Bell, Naugle, & Polusny, 2006; Zinzow et al., 2007).

Traumatic events of all types are associated with an increased risk of mental health disorders in women veterans, including posttraumatic stress disorder (PTSD), depression (e.g., Luxton, Skopp, & Maguen, 2010; Maguen et al., 2010), and substance abuse (e.g., Hankin et al., 1999; Suffoletta-Maierle, Grubaugh, Magruder, Monnier, & Frueh, 2003). Few studies, however, have examined the differential impact of type of trauma on mental health outcomes among women veterans. Suris, Lind, Kashner, Borman, and Petty (2004) found that women veterans with sexual assault histories were more likely to have PTSD and depression than women veterans without this history. Further, women reporting military sexual assault were more likely to have PTSD than women reporting nonmilitary sexual assault; combat exposure was not assessed. Dutra and colleagues (2011) found that military sexual harassment was more strongly associated with PTSD symptoms than combat exposure in a small, active-duty women veteran sample, although other traumatic events were not assessed. In a national sample of male and female Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) veterans not seeking treatment 1-year postdeployment, Vogt and colleagues (2011) found that combat exposure
was not uniquely associated with poorer mental health outcomes (PTSD symptom severity, depression, substance abuse, global mental health functioning), whereas prior life stress and sexual harassment/sexual assault were associated with depression and global mental health functioning. No gender interactions were observed for the associations between combat exposure and mental health outcomes. It remains unknown if, after accounting for the influence of individual traumatic events, combat exposure is salient to mental health outcomes for women veterans presenting for Veterans Affairs (VA) healthcare.

The present study examined the impact of combat exposure on postdeployment mental health outcomes after accounting for the effects of childhood (neglect, physical and sexual abuse) and adult traumatic events (sexual assault, noncombat physical violence) on self-reported posttraumatic stress disorder symptoms (PSS), depressive symptom severity (DSS), and alcohol use among a sample of treatment-seeking Gulf War I and OEF/OIF women veterans.

### Method

#### Participants and Procedure

The sample included 115 Gulf War I and OEF/OIF women veterans presenting for healthcare services at a VA postdeployment specialty clinic. The majority had been active duty (62.6%; n = 72), Gulf War I veterans (75.7%; n = 87). More than half served in the Army (67.0%; n = 77), followed by the Navy (17.8%; n = 17), Air Force (15.0%; n = 13), and Marines (5.2%; n = 6). The mean age of patients was 37.09 (SD = 8.66) years. Of the 105 who provided their ethnic background, most identified as Caucasian (45.2%, n = 52) or African American (32.2%, n = 37), with a small percentage identifying as Hispanic (1.7%; n = 2), American Indian (3.5%; n = 4), or other (1.7%; n = 2). Most veterans reported being married (40.9%; n = 47), never married (27.0%; n = 315), or divorced (18.3%; n = 21), and 41.7% (n = 48) reported a combined total household income of $25,000–$49,999.

As part of routine intake procedures, self-report questionnaires were administered. Approval for waiver of consent and the use of these deidentified clinic data for research purposes was approved by the Institutional Review Board and Research & Development Committee of the VA Puget Sound Health Care System.

#### Measures

**Trauma type.** Lifetime traumatic event exposures were assessed dichotomously (i.e., yes/no) using Composite International Diagnostic Interview items (World Health Organization, 1997) for the following experiences: childhood neglect, childhood sexual abuse, adult sexual assault, and combat or noncombat physical violence.

**PTSD Symptom Severity (PSS).** The PTSD Checklist-Military version (PCL-M; Weathers, Litz, Herman, Huska, & Keane, 1993) is a widely used 17-item self-report of how much participants are bothered by each symptom of PTSD on a 5-point Likert-type scale (1 = Not at all, 5 = Extremely). Total scores range from 17 to 80. The PCL has favorable psychometric properties (Dobie et al., 2002; Monson, Gradus, Young-Xu, Schnurr, & Price, 2008). Internal consistency in this sample was α = .92.

**Depressive Symptom Severity (DSS).** The Patient History Questionnaire-9 (PHQ-9; Spitzer, Kroenke, & Williams, 1999) is a 9-item self-report measure that asks respondents to rate the frequency of depressive symptoms on a 4-point scale (0 = Not at all, 3 = All the time). Total scores range from 0 to 27 (Kroenke, Spitzer, Williams, & Löwe, 2010). The PHQ-9 has sound psychometric properties (Kroenke et al., 2010); internal consistency was α = .91 in this sample.

**Alcohol Use.** The alcohol abuse module of the PHQ (Spitzer et al., 1999) evaluates alcohol misuse in the past 6 months in a yes or no format as follows: (a) alcohol use despite doctor recommendations to stop drinking due to health conditions; (b) alcohol use, intoxication, or feeling hung over at work, school, or taking care of personal responsibilities; (c) missed work or school due to alcohol use or feeling hung over; (d) interpersonal difficulties while drinking alcohol; or (e) operation of an automobile after consuming several or more alcoholic drinks. The PHQ has sound psychometric properties (Spitzer et al., 1999) and internal consistency in this sample was α = .78. Participants were classified as positive for alcohol misuse if at least one item was endorsed.

#### Analytic Strategy

One-way analysis of variance and chi-square analyses were conducted to identify relevant demographics (i.e., p values < .05 for age, era of service, branch of service, duty status, ethnicity, marital status, household income) to include in regression analyses. Separate hierarchical linear regression analyses were conducted with PSS and DSS as dependent, continuous variables. A hierarchical logistic regression analysis was conducted for the dichotomous outcome of alcohol misuse. For each regression analysis, relevant demographic variables identified as other predictors were entered into Block 1 (i.e., ethnicity for alcohol misuse). In Block 2, child sexual assault, child physical abuse, child neglect, adult sexual assault, and adult physical assault were entered. Block 3 included combat exposure (see Table 1).

### Results

More than a quarter of our sample reported combat exposure (27.8%, n = 32/109), 27.0% (n = 31/111) endorsed experiencing childhood sexual assault, 16.5% (n = 19/112) physical assault, and/or 7.0% (n = 8/112) neglect. One fifth (21.7%; n = 25/112) endorsed adult sexual assault and 21.7% reported physical assault (n = 25/109). Patients’ mean scores on the PCL-M
and PHQ-9 were 40.28 (SD = 20.23), 11.34 (SD = 7.50), respectively, and 13.0% (n = 15) screened positive for alcohol misuse.

Results of the hierarchical regressions for PSS and DSS are shown in Table 1. In the initial model for PSS, childhood physical assault was negatively associated with symptom severity. After the inclusion of combat exposure, however, this relationship was not significant, and combat was the only variable significantly positively associated with symptom severity. In model 1, combat exposure was positively associated with adult physical assault and negatively associated with childhood physical abuse. After accounting for combat exposure, the relationship between adult physical assault and DSS was not significant, and combat was the only variable significantly positively associated with PSS. DSS in Model 1 was significantly positively associated with combat exposure, whereas other types of lifetime traumatic events were not significantly associated with poorer mental health outcomes after accounting for the impact of combat. This is the one of the first investigations to examine the influence of multiple forms of interpersonal violence and combat exposure among treatment-seeking women veterans. Because our sample was seeking VA care, this may explain the divergence between our data associating combat exposure with PSS, DSS, and alcohol misuse and previously reported data among national veteran samples that were suggestive of a “healthy warrior effect” (e.g., Vogt et al., 2011). Overall, given that the effects of combat have been understudied in women, the impact of combat on women veterans may be underappreciated in clinical contexts. Our results suggest that comprehensive assessment of combat exposure among women veterans presenting for mental health services is important, and may have implications for triage, diagnosis, and treatment.

Prior childhood physical assault was negatively associated with DSS. This unexpected finding requires replication; it is difficult to speculate about the nature of this relationship given its incongruity with prior research suggesting a positive relationship between adverse childhood events and adult mental health outcomes. It may be that women exposed to childhood physical abuse develop adaptive coping strategies that are particularly salient and adaptive within the military context where violence is a necessary tool. This finding, however, requires replication.

Discussion

Results demonstrated that higher PSS, DSS, and alcohol misuse were found among women veterans who reported combat exposure, whereas other types of lifetime traumatic events were not significantly associated with poorer mental health outcomes after accounting for the impact of combat. This is the one of the first investigations to examine the influence of multiple forms of interpersonal violence and combat exposure among treatment-seeking women veterans. Because our sample was seeking VA care, this may explain the divergence between our data associating combat exposure with PSS, DSS, and alcohol misuse and previously reported data among national veteran samples that were suggestive of a “healthy warrior effect” (e.g., Vogt et al., 2011). Overall, given that the effects of combat have been understudied in women, the impact of combat on women veterans may be underappreciated in clinical contexts. Our results suggest that comprehensive assessment of combat exposure among women veterans presenting for mental health services is important, and may have implications for triage, diagnosis, and treatment.

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Note. Final PSS model: F(6, 104) = 8.56, R² = .34; Final DSS model: F(6, 105) = 7.34, R² = .31; Ethnicity was entered as a predictor in the alcohol misuse model; No demographic variables were entered as predictors in PSS or DSS models. PSS = PTSD symptom severity; DSS = Depressive symptom severity; χ² = likelihood ratio chi-square (i.e., -2LL).

$p < .05$, $^{∗∗}p < .01$.
This study has several limitations that suggest findings should be interpreted cautiously. Ours was a small sample of women seeking treatment at a VA specialty clinic and it is unclear if these results would generalize to male veterans or women veterans outside this specialized context. Also, the dichotomous assessment of adult sexual assault prevents a disentanglement of sexual assaults occurring prior to, during, or following military service. This may be an important distinction, as sexual assault during military service may be particularly detrimental (Surís et al., 2004). Lastly, all assessments were patient-reported rather than based on clinician assessment and our measure of PSS may not be sensitive to nonmilitary-related distress. Future studies should utilize structured clinical interviews and more detailed assessments of lifetime- and combat-related trauma exposure, ideally in a longitudinal manner.

In sum, results highlight the impact of combat exposure on women veterans’ postdeployment mental health. Due to the profound impact of combat exposure, women veterans should be routinely screened for combat exposure and mental health sequelae, as this should inform treatment planning.

References


