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Examining Spouse/Partner Presence as a Moderator in the Relationship between Mental Health Symptoms and Alcohol Use in OEF/OIF Veterans

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Abstract

Veterans from the conflicts in Afghanistan (Operation Enduring Freedom; OEF) and Iraq (Operation Iraqi Freedom; OIF) have reported elevated rates of alcohol consumption, and greater depression and posttraumatic stress disorder (PTSD) symptoms are associated with increased alcohol use. Presence of a spouse/partner, which has been associated with reduced drinking, may buffer the relationship between mental health symptoms and alcohol consumption. To examine this hypothesis, the current study utilized baseline survey data from OEF/OIF veterans (N=325) enrolled in a brief alcohol intervention. Spouse/partner presence moderated the relationship between depression symptoms and alcohol consumption such that depression was positively associated with drinking for veterans *without* a spouse/partner. Exploratory analyses indicated that the relationship between depression and alcohol use may be particularly salient for veterans without a spouse/partner and a lower number of deployments. Spouse/partner presence did not moderate the relationship between PTSD symptoms and alcohol consumption. Implications of the findings are discussed.

Keywords

Alcohol; OEF/OIF; Depression; PTSD; Spouse/Partner

Findings have indicated that military personnel involved in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) report greater rates of alcohol use compared to non-OEF/OIF veterans (Hawkins, Lapham, Kivlahan, & Bradley, 2010) as well as non-veterans (Wagner et al., 2007). Nearly 22% of OEF/OIF veterans screened positive for alcohol misuse (Hawkins et al., 2010), compared to only 10.5% of non-OEF/OIF veterans. Additional findings have reported that 40% of OEF/OIF veterans engaged in risky drinking (Calhoun, Elter, Jones, Kudler, & Straits-Troster, 2008). Not exclusive to OEF/OIF male

veterans, risky levels of alcohol consumption have been reported in OEF/OIF female veterans (Nunnink et al., 2010), with trends toward greater alcohol misuse compared to non-OEF/OIF female veterans (Hawkins et al., 2010). Among OEF/OIF populations, higher levels of alcohol misuse have been associated with a host of physical, psychological, and social consequences including reduced quality of life and mental health symptoms (Kehle et al., 2011; McDevitt-Murphy et al., 2010).

Common mental health symptoms associated with alcohol misuse are posttraumatic stress disorder (PTSD) and depression symptoms. Studies have shown variability among rates of PTSD symptoms in OEF/OIF samples, with estimates ranging from 16% meeting full or subthreshold diagnostic criteria to nearly 50% of veterans endorsing two or more PTSD symptoms on brief screeners (Baker et al., 2009; Kehle et al., 2011; Khaylis, Polusny, Erbes, Gewirtz, & Rath, 2011; McDevitt-Murphy et al., 2010). Rates of depression symptoms have also varied, with 23% to 43% of OEF/OIF veterans endorsing one or more symptoms on brief depression screeners (Baker et al., 2009; Milliken et al., 2007). Several studies among veterans have indicated that increased alcohol misuse is associated with increased depression and PTSD symptoms (Burnett- Zeigler et al., 2011; Gewirtz, Polusny, DeGarmo, Khaylis, & Erbes, 2010; James, Van Kampen, Miller, & Engdahl, 2013; McDevitt-Murphy et al., 2010; Meis, Erbes, Polusny, & Compton, 2010; Ramchand et al., 2011; Scott et al., 2013). Such reports are consistent with the established link between alcohol misuse and depression (e.g., Davis, Uezato, Newell, & Frazier, 2008; Mueller, 1999) as well as alcohol misuse and PTSD symptoms in the broader literature (e.g., Stewart, 1996). While theoretical explanations have been posited to account for the comorbidity of such mental health symptoms and alcohol misuse (Brown & Wolfe, 1994; Stewart & Conrod, 2003), not all findings in the OEF/OIF literature support the co-occurrence of alcohol use and depression symptoms (James et al., 2013; Tsai, Pietrzak, Southwick, & Harpaz-Rotem, 2011). Further, not all OEF/OIF studies have reported a strong relationship between alcohol misuse and PTSD symptoms (Scott et al., 2013). Even when statistically significant relationships exist, the strength of the relationships are typically in the small to medium range (r 's = .16 - .35) (Erbes, Westermeyer, Engdahl, & Johnsen, 2007; Gewirtz et al., 2010; James et al., 2013).

One variable that may act as a protective factor and weaken the relationship between mental health symptoms and alcohol misuse is presence of a spouse or partner. This is consistent with the buffering hypothesis of social support in which the presence of interpersonal support reduces the likelihood of adverse outcomes for individuals experiencing psychosocial stress, potentially through the provision of physical and/or psychological support (Burman & Margolin, 1992; Cohen & McKay, 1984). Empirical reviews have indicated that marriage is associated with generally improved mental health outcomes including enhanced subjective well-being, lower mortality, and reduced depression for men and women (Burman & Margolin, 1992; Ross, Mirowsky, & Goldsteen, 1990; Waite & Lehrer, 2003). Married individuals as well as individuals who are unmarried, but have a partner reported greater life satisfaction compared to those without a spouse/partner (Stutzer & Frey, 2006). In OEF/OIF veterans, the presence of a spouse or partner has been associated with less alcohol consumption (Burnett-Zeigler et al., 2011; Calhoun et al., 2008), and similarly, higher levels of social support have been linked to lower PTSD and depression

symptoms (Gewirtz et al., 2010; James et al., 2013). Some research indicates that individuals with comorbid PTSD and alcohol dependence are less likely to be in a stable relationship compared to those with PTSD alone (Riggs, Rukstalis, Volpicelli, Kalmanson, & Foa, 2003). Further, the absence of a spouse/partner for veterans in inpatient substance use treatment (including alcohol misuse) contributed to increased risk of mortality at one and five years post-treatment (Johnson, Finney, & Moos, 2005). Plausibly, findings suggest that veterans without a spouse/partner are more likely to experience co-occurring alcohol misuse and mental health difficulties, which in turn are related to more adverse outcomes.

To begin to investigate this gap in the literature, the current study examined the moderating effects of spouse/partner presence on the relationship between depression symptoms and alcohol consumption as well as PTSD symptoms and alcohol consumption in OEF/OIF veterans. We hypothesized that the presence of a spouse/partner would serve as a protective factor in the relationship between the mental health symptoms and alcohol consumption. Additionally, little research has examined how number of deployments may be related to mental health symptoms and alcohol use in OEF/OIF veterans. It is possible that a greater number of deployments may increase exposure to traumatic events, which in turn, is associated with increased mental health symptoms and alcohol consumption (Baker et al., 2009). Some findings have indicated that number of deployments is related to increased alcohol use (Jones, Rona, Hooper, & Wesseley, 2006). Further, number of deployments has evidenced positive associations with PTSD symptom severity (Phillips, Leardmann, Gumbs, & Smith, 2010; Reger, Gahm, Swanson, & Duma, 2009) and a trend towards positive associations with depressive symptoms in OIF veterans (Reger et al., 2009). To explore the plausible relationship among deployment frequency, mental health symptoms, and alcohol use, exploratory analyses also examined the interaction among spouse/partner presence, mental health symptoms, and number of deployments as it relates to alcohol consumption.

Method

Participants and Procedures

Participants included veterans enrolled in a larger study examining the efficacy of a brief alcohol intervention aimed at reducing alcohol consumption and alcohol-related problems among OEF/OIF veterans. Research approval was obtained from both the University's Institutional Review Board and the Veterans' Hospital Subcommittee on Research Safety. Participants were recruited from a primary care clinic at the hospital from January 2011 to February 2013. All OEF/OIF veterans who presented at the clinic were eligible for the study, and of the 409 OEF/OIF veterans approached, 325 (79.5%) agreed to participate in the study. For those interested in participating, informed consent was obtained with a graduate-level research assistant in a private office, and baseline questionnaires were completed. Participants were randomized to either a personalized drinking feedback intervention or a control condition in which general educational information about alcohol use was provided. For the current analyses, only baseline data provided by participants were examined. Participants were compensated \$30 for completing the baseline assessment. Please see Table 1 for descriptive statistics.

Measures

Demographics including Spouse/Partner Presence—Participants were asked to complete a short sequence of questions collecting information on general demographics such as age, gender, and military service (e.g., branch, number of deployments, and rank). In this section, participants also responded to the item, “Do you currently have a spouse/partner?” Veterans who responded “yes” were coded as 1 and “no” was coded as zero.

Alcohol Use—The Daily Drinking Questionnaire (DDQ) (Collins, Parks, & Marlatt, 1985) assesses drinking using a calendar-based method (Carey, Carey, Maisto, & Henson, 2006; Martens, Ferrier, & Cimini, 2007). Participants were provided definitions for a standard drink: a 12oz beer (i.e., most bottled or canned beer), a 5oz glass of wine (i.e., a regular-sized glass of wine), or a 1.25oz (one shot) drink of hard alcohol. Individuals were asked to record the typical number of drinks consumed on each day of the week during the past 30 days. An average drinks per week variable was then calculated.

Mental Health Symptoms—The Posttraumatic Stress Disorder Checklist-Military version (PCLM) (Weathers, Litz, Herman, Huska, & Keane, 1993) assesses the presence and severity of PTSD symptoms as defined by the DSM-IV. Comprised of 17 items, participants are asked to indicate the degree to which they have been bothered by various PTSD symptoms over the past month. Responses range from 1 (*not at all*) to 5 (*extremely*). Items were added to provide a continuous measure of PTSD symptom severity. A diagnostic cut-off score of 50 has evidenced sensitivity greater than .69 and specificity greater than .83 in detecting possible PTSD in military samples (Karstoft, Andersen, Bertelsen, & Madsen, 2014). Internal consistency for the current sample was high ($\alpha = .96$), consistent with previous reports (Weathers et al., 1993).

The Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977) assesses depressive symptoms using 20 items on a 4-point Likert scale. Participants were asked to indicate the number of times they have experienced various symptoms of depression in the past week, ranging from 0 (*<1 day*) to 3 (*5-7 days*). Higher scores are indicative of greater depression symptoms. Using the recommended cut-off of 16 (Radloff, 1977), the CES-D has evidenced sensitivity of .88 and specificity of .85 (Head et al., 2013).

Analytic Plan

Covariates were chosen by examining bivariate correlations among variables (see Results section) to gauge their potential impact on the criterion variable, alcohol consumption (Tabachnick & Fidell, 2001). Moderation was tested by entering the covariates on the first step, the independent variable (i.e., PTSD symptoms or depression symptoms) and the moderating variable (i.e., spouse/partner presence) on the second step, and the product of the independent variable and moderator on the third step (Baron & Kenny, 1986). All variables were centered or dummy coded to reduce unnecessary collinearity. Interaction patterns were examined using a simple slopes analysis as outlined by Aiken and West (1991), with dichotomous variables examined at both levels of the variable (e.g., presence or absence of a spouse/partner) and continuous variables examined on lines representing one standard deviation above and below the mean (e.g., high and low depression symptoms). Moderating

analyses have effectively been applied to cross-sectional models although inferences of causality and temporal ordering of variables are precluded (Judd & Kenny, 1981; Hayes, 2013).

Results

Participants reported consuming on average 11.15 ($SD = 17.58$) drinks per week, and 73.5% reported having a spouse or partner. Mean PTSD symptom score was 42.60 ($SD = 18.54$) with 34.8% of veterans reporting scores consistent with a possible PTSD diagnosis, using the diagnostic cut-off of 50. Mean depression symptom score was 15.79 ($SD = 12.87$) with 38.2% of veterans reporting scores consistent with a possible diagnosis of major depression, using the typical cut-off of 16. Bivariate analyses (see Table 2) indicated that neither PTSD nor depressive symptoms were significantly correlated with drinks per week (p 's $> .05$), supporting the examination of moderation. Consistent with previous findings (Burnett-Zeigler et al., 2011; Calhoun et al., 2008), age and gender were significantly correlated with alcohol consumption, and accordingly, were included as covariates in the current analyses.

Moderation Analyses

Regression results across the moderation models are presented in Table 3. Findings indicated that the moderation model examining PTSD symptoms included a significant main effect for spouse ($\beta = -.16, p < .01$) such that participants without a spouse tended to drink more than those reporting the presence of a spouse/partner. However, the main effect for PTSD symptoms on alcohol consumption, as well as the interaction term between PTSD symptoms and spouse, were not significant (p 's $> .05$).

The moderation model examining depression symptoms included a significant main effect for spouse ($\beta = -.15, p < .01$) such that participants without a spouse reported greater alcohol consumption than those reporting the presence of a spouse/partner. Although the main effect for depression symptoms was not significant, the interaction term between spouse/partner presence and depression symptoms was significant, $R^2 = .02, F(1, 318) = 7.40, p < .01$. As hypothesized, an examination of simple effects (see Figure 1) indicated that the relationship between depression symptoms and alcohol consumption was not significant for those reporting a spouse/partner ($\beta = -.03, p = .63$). However, for participants without a spouse/partner, greater depression symptoms were associated with increased alcohol consumption ($\beta = .22, p = .04$).

Exploratory analyses sought to examine if number of deployments may be involved in the relationship among spouse/partner presence, mental health symptoms, and alcohol use. Three-way interactions were comprised of number of deployments, spouse/partner presence, and either PTSD or depression symptoms. Results indicated that the PTSD symptom model remained non-significant ($p = .19$). However, the model examining the 3-way interaction with depression symptoms was significant, $R^2 = .01, F(1, 313) = 3.98, p = .047$. Consistent with the previous findings, the main effect for spouse/partner remained significant ($\beta = -.15, p < .01$). The 2-way interaction between spouse and depression also remained significant ($\beta = -.29, p = .01$) such that for those without a spouse/partner, greater depression symptoms were associated with increased alcohol consumption. Building on the

previous findings, the significant 3-way interaction ($\beta = .23, p = .047$) indicated that for participants without a spouse/partner and a *lower* number of deployments, greater depression symptoms were associated with increased alcohol consumption. This was in comparison to participants without a spouse/partner and a higher number of deployments. For participants with a spouse/partner, lower deployment numbers were associated with reduced alcohol consumption compared to those with a greater number of deployments (see Figure 2).

Given findings that PTSD and depression may co-occur (Caska & Renshaw, 2011; James et al., 2013), the comorbidity of PTSD and depression was examined to better verify the unique depression findings. As determined by cut-off values on the PCLM and CES-D, a comorbidity variable was calculated by assigning veterans without a possible diagnosis a value of zero, veterans with one possible diagnosis (either major depression or PTSD) a value of 1, and veterans with possible co-occurring diagnoses (both major depression and PTSD) a value of 2. Overall, 27.1% of veterans had possible co-occurring diagnoses. When inserting the comorbidity variable into the 2-way and 3-way moderation models, the main effect of spouse/partner presence remained significant, consistent with results above. However, no other main effects or resulting interaction terms were significant (p 's $> .05$). Results provide support for the unique relationship between depression (rather than co-occurring PTSD and depression) and increased alcohol use for OEF/OIF veterans without a spouse/partner.

Discussion

The current study sought to examine the moderating effect of spouse/partner presence on the relationship between mental health symptoms, specifically depression and PTSD symptoms, and alcohol consumption. Exploratory analyses included an examination of number of deployments as it may relate to mental health symptoms and spouse/partner presence in understanding increased alcohol use. Main effect findings were consistent with previous reports that spouse/partner presence is associated with reduced alcohol use (Burnett-Zeigler et al., 2011; Calhoun et al., 2008). For veterans with a spouse/partner, alcohol consumption did not vary with depression symptoms, consistent with the buffering hypothesis. Potentially, spouse/partner presence weakens the depression-alcohol use relationship by promoting alternate forms of coping with depression symptoms, aside from alcohol consumption (Holahan, Moos, Holahan, Cronkite, & Randall, 2003). For example, spouse/partners may be indirectly involved with the veteran's acquisition of alternative coping strategies by encouraging veterans to seek treatment. Burnett-Zeigler et al. (2011) reported that OEF/OIF veterans receiving mental health services most commonly indicated that their spouse/partner had influenced them to pursue care (beyond other social influences such as peers, other family members, physicians or mental health professionals).

Findings highlight that the relations between depression symptoms and alcohol consumption may be particularly salient in OEF/OIF veterans who do not have a spouse/partner and have experienced a lower (rather than higher) number of deployments. Although previous literature supports findings that increased depression and absence of a spouse/partner are related to increased alcohol use, independently (Burnett-Zeigler et al., 2011), little research

has been conducted examining the potential impact of number of deployments on alcohol use in OEF/OIF veterans. Research relating number of deployments to mental health difficulties is mixed (Fear et al., 2010; Phillips et al., 2010; Reger et al., 2009) with less support for direct relations between number of deployments and alcohol misuse (Jones et al., 2006). Some have suggested that veterans with increased deployments may be healthier and more resilient compared to those with fewer deployments (Reger et al., 2009). Supporting this perspective, Fear et al. (2010) reported trends of increased mental health symptoms including items pertaining to depression as deployment numbers decreased, and mental health difficulties reduce the likelihood of future deployments (Hoge, Auchterlonie, & Milliken, 2006). It is unknown how many veterans in the current sample may have left military service due to mental health symptoms following their first deployment. Nonetheless, findings emphasize complex relations among number of deployments, mental health symptoms, and alcohol consumption. OEF/OIF veterans at particular risk for heavy alcohol consumption appear to be those with single deployments coupled with increased depressive symptoms and reduced interpersonal support via absence of a spouse/partner.

Contrary to hypotheses, although consistent with previous reports that alcohol use did not exacerbate the relationship between PTSD and relationship quality (Meis et al., 2010), spouse/partner presence did not impact the relationship between PTSD symptoms and alcohol consumption. Further examination of number of deployments was also non-significant. In working to understand the significant depression although non-significant PTSD findings, mean depression scores for the current sample were similar to previous scores reported in veterans (Groessler, Weingart, Johnson, & Baxi, 2012). Prevalence of veterans meeting possible diagnosis for major depression in the current sample (38%) is slightly elevated, yet comparable to other reports from OEF/OIF veterans (5% to 37%) (Pittman, Goldsmith, Lemmer, Kilmer, & Baker, 2012; Renshaw, Rodrigues, & Jones, 2009). In contrast, mean PTSD symptom severity in the current participants ($M = 42.60$, $SD = 18.54$) appeared to be relatively greater than not all (McDevitt-Murphy et al., 2010), but several previous reports of PTSD symptoms in OEF/OIF veterans (Mean range = 29.34 – 35.82) (Blow et al., 2013; Caska & Renshaw, 2011; Erbes et al., 2007; Gewirtz et al., 2010; James et al., 2013; Meis et al., 2010).

Relative to depressive disorders, alcohol use disorders, and other anxiety disorders, PTSD symptoms have evidenced the largest association with disruptions in social functioning and quality of life (Kehle et al., 2011). A recent meta-analysis by Taft et al. (2011) reported an effect size of .38 between PTSD symptoms and intimate relationship discord, which increased to .41 in military populations. PTSD symptom severity has been associated with reduced couple adjustment (Gewirtz et al., 2010), and positively related to relationship distress, dissatisfaction, and difficulties (Khaylis et al., 2011; Meis et al., 2010; Monson, Taft, & Fredman, 2009) including spouse burden (Caska & Renshaw, 2011). Given that the current OEF/OIF sample appears relatively high in PTSD symptom severity, findings from previous studies suggest that the presence or absence of a spouse/partner in itself may not buffer alcohol consumption. Rather, more specific relationship factors for those with increased PTSD symptoms may need to be taken under consideration. For example, couple adjustment following deployment(s), relationship distress or satisfaction, and spouse burden

should be investigated to better understand the potential influence of intimate relationships on the association between PTSD symptoms, deployment(s), and alcohol use.

While the current study shed light on factors which may assist in our understanding of the relationship between depression or PTSD symptoms and alcohol consumption, notable limitations exist. Although part of a larger clinical trial, data used for the current study were cross-sectional baseline data. It is possible that findings are influenced by a selection bias such that healthier veterans were more likely to obtain a spouse/partner or complete multiple deployments compared to less healthy individuals. Such limitations underscore restrictions to causal and temporal interpretability. Further, where the current sample included veterans who served in the OEF and OIF conflicts, time since their deployment(s) was not measured. Because amount of time since deployment has been related to mental health symptom severity (Gewirtz et al., 2010; James et al., 2013), the findings may be replicated after adjusting for time since deployment or using a longitudinal research design to replicate the research question at multiple time points post-deployment. Last, as the study specifically focused on OEF/OIF veterans, findings may not generalize to non-OEF/OIF veterans or non-veteran populations, and results should be replicated in alternative populations.

In conclusion, current findings highlight the protective potential of having a spouse/partner on the relationship between depression symptoms and increased alcohol use in OEF/OIF veterans. Veterans without a spouse/partner and a history of a single deployment may be at particular risk for heavy drinking when experiencing increased depression. While the moderating impact of spouse/partner presence may in part be reflecting encouragement to seek mental health services, future research should further examine mechanisms of this buffering effect. Contrary to the research hypothesis, spouse/partner presence did not relate to the relationship between PTSD symptoms and alcohol consumption. Findings may emphasize the importance of examining more specific relationship factors particularly in veterans with elevated PTSD symptoms to better gauge the interrelations among PTSD symptom severity, alcohol consumption, and spouse/partner dynamics following deployment(s).

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Figure 1.

The moderating effect of spouse/partner presence on depression symptoms and drinks per week ($p < .01$). The relationship between depression symptoms and drinks per week was significant and positive for those without a spouse/partner, although not significant for those with a spouse/partner.

Figure 2.

The 3-way interaction among spouse/partner presence, depression symptoms, and number of deployments on alcohol consumption ($p = .047$). Veterans without a partner and a lower number of deployments are at the greatest risk for heavy alcohol use as depression increases.

Table 1

Descriptive Statistics

Variable	Overall M (SD) or % (n)
Age	32.20 (8.18)
Gender	
Men	93.2% (303)
Women	6.8% (22)
Ethnicity	
European American	81.5% (265)
African American	8.6% (28)
Hispanic	4.9% (16)
Native American	2.2% (7)
Asian/Pacific Islander	1.2% (4)
“Other”	1.5% (5)
Years in service	2.96 (1.42)
Number of deployments	1.61 (.90)
Status	
Regular	70.5% (229)
National Guard	19.4% (63)
Reserves	9.5% (31)

Note. N=325

Table 2

Bivariate Statistics

	1	2	3	4	5	6
1. Age	---					
2. Gender	.06	---				
3. Spouse/partner	.22 ***	.06	---			
4. Drinks per week	-.16 **	.13 *	-.17 **	---		
5. CES-D total	-.02	-.03	.01	.05	---	
6. PCLM total	-.05	.01	.11 *	.06	.77 ***	---

Note. CES-D = Center for Epidemiologic Studies-Depression Scale; PCLM = PTSD Checklist-Military version

*
 $p < .05$

**
 $p < .01$

 $p < .001$

Table 3

Regression Results Examining the Moderating Effect of Spouse/Partner Presence on Mental Health Symptoms and Drinks per Week

Variable	<i>b</i>	<i>SE</i>	β	<i>t</i>
IV: Depression symptoms				
Gender	8.53	3.03	0.15	2.82**
Age	-0.22	0.10	-0.13	-2.31*
Spouse/partner	-4.86	1.76	-0.15	-2.76**
CES-D	0.36	0.13	0.33	2.87**
CES-D X Spouse	-0.39	0.14	-0.31	-2.72**
IV: PTSD symptoms				
Gender	8.53	3.06	0.15	2.79**
Age	-0.22	0.10	-0.13	-2.31*
Spouse/partner	-5.15	1.81	-0.16	-2.84**
PCLM	0.08	0.09	0.11	0.98
PCLM X Spouse	-0.04	0.10	-0.04	-0.40

Note. CES-D = Center for Epidemiologic Studies-Depression Scale; PCLM = PTSD Checklist-Military version

*** $p < .001$

* $p < .05$

** $p < .01$