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Alcohol Use Among Never-Deployed U.S. Army Reserve and National Guard Soldiers: The Effects of Nondeployment Emotions and Sex

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Background: Limited research shows that mental health problems are prevalent among never-deployed soldiers and many experience negative emotions related to their nondeployment. U.S. Army Reserve/National Guard (USAR/NG) soldiers are also at high risk for alcohol misuse. However, it is not known if nondeployment emotions contribute to an increased risk of alcohol misuse among never-deployed USAR/NG soldiers.

Methods: Data are from Operation: SAFETY (Soldiers and Families Excelling Through the Years), an ongoing study of USAR/NG soldiers. We used regression models to examine the relations between nondeployment emotions, assessed by the Non-Deployment Emotions (NDE) Questionnaire, and a range of alcohol use outcomes, assessed by the Alcohol Use Disorders Identification Test and standard quantity and frequency questions, among a sample of never-deployed soldiers who were partnered at baseline (N = 174). Final models controlled for years of military service, current number of close military friends in the social network, marital satisfaction, and depression. We also tested for potential differences in these associations by sex.

Results: Nondeployment emotions were associated with frequency of getting drunk (adjusted risk ratio [aRR] = 1.02, 95% CI: 1.01, 1.04; $p < 0.05$) and typical number of drinks consumed during a drinking episode (aRR = 1.03, 95% CI: 1.01, 1.04; $p < 0.01$). Nondeployment emotions had a trend-level association with percent of days drinking (adjusted odds ratio = 1.05, 95% CI: 1.00, 1.11; $p = 0.055$). Nondeployment emotions had a significant interaction with sex ($p < 0.05$) on the likelihood of alcohol problems, such that only male soldiers experienced a greater likelihood of alcohol problems when they had highly negative nondeployment emotions. There was no relation between nondeployment emotions and alcohol problems among female soldiers.

Conclusions: Findings demonstrate that greater nondeployment emotions are associated with increased alcohol use among never-deployed USAR/NG soldiers. The NDE Questionnaire may assist in identifying those at highest risk for alcohol problems.

Key Words: Military, Nondeployment Emotions, Quantity and Frequency of Alcohol Use, Alcohol Problems.

MILITARY PERSONNEL ARE known to be at increased risk for problems with alcohol and other substances (Bray et al., 2013; Eisen et al., 2004; Green et al., 2014; Hoopsick et al., 2017; Jacobson et al., 2008; Milliken et al., 2007; Thomas et al., 2010), especially among current era service members (Seal et al., 2007, 2011). Findings from the U.S. Department of Defense Health Behavior Survey indicate that nearly 1 in 4 Operation Enduring Freedom/Operation Iraqi Freedom service members report past month heavy drinking (Bray et al., 2010). Further, rates of heavy drinking and binge drinking among this population have increased over time (15 to 20% and 35 to 47% from 1998 to 2008, respectively; Bray et al., 2013), representing a significant and growing public health issue. The U.S. Armed Forces adhere to a strict "zero tolerance" policy regarding drug use, which likely contributes to lower rates of *illicit* substance use among soldiers compared to civilian populations (Platteborze et al., 2013), but may also contribute to higher rates of *licit* substance use, including alcohol. Service members also report high levels of stress, anxiety, depression, posttraumatic stress disorder (PTSD), and suicidality (Bray et al., 2010), which have been associated with alcohol misuse in military cohorts (Bravo et al., 2016; Cohen et al., 2016; Fink et al., 2016).

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Deployment and Alcohol

There is robust evidence in the literature demonstrating the association between deployment and/or combat exposure and alcohol misuse in military populations (Bray and Hourani, 2007; Green et al., 2014; Hoge et al., 2006; Hoopsick et al., 2018b; Jacobson et al., 2008; Milliken et al., 2007; Seal et al., 2011; Vest et al., 2018; Wright et al., 2012). While rates of alcohol misuse among service members are generally high, particularly for binge and heavy drinking (Bray et al., 2013), some evidence suggests that deployment and/or combat may contribute to an increased risk of alcohol misuse as a means of self-medication in response to war-related psychological sequelae, such as PTSD and depression (Wright et al., 2012). Less is known about the drinking patterns among never-deployed soldiers, but a large cross-sectional study suggests that there are no significant differences between recently deployed and never-deployed soldiers in rates of alcohol use, binge drinking, heavy drinking, the amount of alcohol consumed per day, or alcohol use disorders (Trautmann et al., 2014). However, this study examined a sample of German active duty soldiers and it is not known if these results can be generalized to U.S. Reserve/Guard populations. Further, this study did not examine what factors might contribute to alcohol problems among never-deployed soldiers.

National Guard and Reserve Populations

Although Reserve/Guard soldiers have similar roles and combat experiences as active duty soldiers, research has shown that Reserve/Guard soldiers are at greater risk of problems with substance use and mental health (Cohen et al., 2015; Griffith, 2010; Hotopf et al., 2006; Jacobson et al., 2008; Milliken et al., 2007; Rundell, 2006; Vasterling et al., 2010). National prevalence estimates suggest that past month alcohol use is high (74.0%) among current era Reserve service members (Hoopsick et al., 2017). There are over 1 million service members enlisted in a Ready Reserve component of the U.S. military, the greatest proportion of which (over 40%) is comprised of U.S. Army Reserve/National Guard (USAR/NG) soldiers (Department of Defense, 2013). USAR/NG soldiers represent a high-risk, but understudied, population. Despite the evidence demonstrating high risk for alcohol misuse among Reserve/Guard members, much of the literature in this area focuses only on the effects of deployment (Jacobson et al., 2008). However, a recent report from the Defense Manpower Data Center (2017) demonstrates that a significant proportion of Reserve/Guard soldiers may never deploy.

Negative Emotions Related to Nondeployment

It is not known if the event of not being deployed in and of itself contributes to poor outcomes for nondeployed soldiers, but literature demonstrates that these soldiers are equally affected by problems with mental health as their deployed counterparts (Wells et al., 2010). In fact, never being deployed may have deleterious effects on the emotional well-being of Reserve/Guard service members; our previous work (Hoopsick et al., 2018a) demonstrated that never-deployed USAR/NG soldiers experience negative emotions related to their nondeployment, including feelings of guilt, decreased value, decreased connectedness, and decreased camaraderie within their unit. Further, more negative nondeployment emotions are associated with worse mental health outcomes, including anger, anxiety, depression, and PTSD symptomatology.

Reasons for feeling negative emotions related to never having been deployed may vary. Previous work has demonstrated that individuals who have never personally experienced a traumatic event may experience PTSD symptomatology via "vicarious trauma" (Fillo et al., 2018). It is not known if never-deployed soldiers experience vicarious traumatization through secondary exposure to traumas experienced by their deployed peers. It is also possible that these nondeployment emotions are akin to "survivor's guilt," in which an individual experiences negative emotional states when others were physically or psychologically injured, but the individual remained alive and uninjured (Hutson et al., 2015). Additionally, never being deployed may interfere with unit connectedness, which has been shown to be important for overall service member well-being (Kline et al., 2013; Vest et al., 2017; Walsh et al., 2014). Further, feelings of shame and guilt are associated with alcohol problems among civilians (Luoma et al., 2017). Finally, other work suggests that greater mental health problems are associated with a lower likelihood of being deployed, resulting in a biased selection of individuals for deployment (i.e., "healthy warrior effect") (Wilson et al., 2009). Research is needed to understand the potential role of negative nondeployment emotions in alcohol use behaviors within the context of mental health symptomatology, more generally.

The Role of Sex Differences

A comprehensive review of the literature demonstrated that there are robust sex differences for many alcohol use outcomes, and that more research is needed to examine for interactions between sex and environmental factors (Salvatore et al., 2017). National data indicate that males aged 18 years and older are more likely to engage in frequent heavy drinking than females of the same age (10.9% vs. 3.6%; SAMHSA, 2014). Among young veterans, the prevalence of binge drinking among males is nearly twice that of their female counterparts (43.2% vs. 22.9%; SAMHSA, 2010). Consistent with these findings, the prevalence of frequent binge drinking among male soldiers returning from deployment is 3 times that of females (21.2% vs. 7.4%; Sayko Adams et al., 2017). Other research in non-U.S. military samples also suggests that male military personnel are

significantly more likely to have problems with alcohol than their female counterparts (Waller et al., 2015). Although nondeployment emotions are prevalent among both male and female soldiers that have never been deployed (Hoopsick et al., 2018a), it is not known how these emotions might affect alcohol use outcomes or if these associations differ on the basis of the soldier's sex.

The Current Research. Evidence regarding negative emotions related to nondeployment (Hoopsick et al., 2018a) among never-deployed soldiers and the heightened risk for behavioral health problems among Reserve/Guard populations (Cohen et al., 2015; Griffith, 2010; Hotopf et al., 2006; Jacobson et al., 2008; Milliken et al., 2007; Rundell, 2006; Vasterling et al., 2010) suggests that never-deployed USAR/NG soldiers may also be vulnerable to poor outcomes. Given the gaps identified in the literature and emerging evidence on the well-being of never-deployed service members, the goal of this study was to examine the potential relations between nondeployment emotions and a range of alcohol use outcomes among a sample of male and female never-deployed USAR/NG soldiers. We also aimed to explore the interactions between nondeployment emotions and sex on these alcohol outcomes, given the difference in drinking behaviors between male and female service members (SAMHSA, 2010; Sayko Adams et al., 2017; Waller et al., 2015).

MATERIALS AND METHODS

Recruitment

The current research examined a subset of data from the Operation: SAFETY (Soldiers and Families Excelling Through the Years) study, an ongoing survey-based study that examines the health and well-being of USAR/NG soldiers and their partners. Operation: SAFETY participants were recruited from 47 units across New York State between the summer of 2014 and the fall of 2015. In order to be eligible for the study, the following inclusion criteria must have been met: (i) the couple was married or living as if married; (ii) 1 member of the couple was a current Army Reserve Soldier or National Guard Soldier; (iii) the soldier was between the ages of 18 and 45; (iv) both partners were able to speak and understand English; (v) both partners were willing and able to participate; and (vi) both partners had at least 1 alcoholic beverage in the past year.

A total of 731 soldiers and partners were eligible for inclusion in Operation: SAFETY. Of those, 572 (78%) agreed to participate and 83% of couples (N = 472) completed some part of the survey. Couples where a civilian partner screened for the study (n = 11) were less likely to enroll ($p < 0.001$). Given that the nature of the main study was to examine spousal influence, only surveys where both partners completed the entire survey were included for follow-up (N = 418). However, no differences existed in soldiers' screening health variables between those who enrolled and completed and those who enrolled and did not complete.

Procedure

Participants completed 3 online surveys (baseline with 2-yearly follow-ups) administered through StudyTrax™ (ScienceTRAX, Macon, GA), a secure HIPAA-compliant online survey programming software which allowed for data encryption. Each participant received a $60 check for completing the baseline survey and $70 for each of the 2 follow-up surveys ($200 per person/$400 couple over the study period). The protocol was approved by the University at Buffalo Institutional Review Board, the Army Human Research Protections Office, Office of the Chief, Army Reserve, and the Adjutant General of the National Guard.

Participants

In the current research, we cross-sectionally examined wave 2 data (i.e., the first follow-up) from Operation: SAFETY among soldiers who reported never having been deployed (N = 174). The majority of participants were male and predominantly non-Hispanic white, had at least some college education, and had a median family income between $40,000 and $59,999. Male soldiers ($n$ = 121) had a mean (standard deviation [SD]) age of 29.7 (6.2) years and served an average of 5.5 (3.9) years in the military. Female soldiers (n = 53) had a mean age of 30.5 (6.7) years and served an average of 4.4 (3.0) years in the military (Table 1). There were no differences between these never-deployed soldiers and previously deployed soldiers in the full sample on the basis of race, education, marital satisfaction, or frequent heavy drinking ($p > 0.05$).

Measures

Alcohol Problems. We used the Alcohol Use Disorders Identification Test (AUDIT) to assess alcohol problems (Saunders et al., 1993). This 10-item measure consists of questions about current alcohol use and alcohol-related consequences and is scored 0 to 4 on a Likert scale with responses ranging from "Never" to "Daily or Almost Daily." Summary scores range from 0 to 40, with higher scores indicating greater alcohol problems. The AUDIT had good internal consistency in our sample ($\alpha_{men} = 0.76$, $\alpha_{women} = 0.80$).

Alcohol Use. We assessed patterns of typical alcohol use over the last year using standard *quantity* and *frequency* questions (Cahalan et al., 1969), including the frequency of getting drunk, the typical number of drinks consumed in a single setting, and the percent of days drinking over the last 12 months.

Nondeployment Emotions. A measure of nondeployment emotions was added to the study after baseline recruitment had begun. Thus, wave 2 represents the first collection of data related to nondeployment emotions. The addition of this measure was approved by the State University of New York at Buffalo's Institutional Review Board and was included in subsequent follow-up interviews of never-deployed soldiers. We assessed negative emotions related to

Table 1. Demographic Characteristics of Never-Deployed U.S. Army Reserve and National Guard Soldiers at First Follow-up

	Male soldiers, N = 121% (N) or M (SD)	Female soldiers, N = 53% (N) or M (SD)
Age, years	29.72 (6.22)	30.52 (6.68)
Race/ethnicity		
Non-Hispanic white	76.03% (92)	83.02% (44)
Non-Hispanic black	8.26% (10)	1.89% (1)
Hispanic	8.26% (10)	5.66% (3)
Other	5.79% (7)	7.55% (4)
Education		
High school graduate	15.70% (19)	5.66% (3)
Some college	51.24% (62)	54.72% (29)
College degree	33.06% (40)	39.62% (21)
Relationship status		
Married/cohabitating	92.56% (112)	96.23% (51)
Separated/divorced	7.44% (9)	3.77% (2)
Median family income	$40,000 to $59,000	$40,000 to $59,000

never having been deployed with the Non-Deployment Emotions (NDE) Questionnaire (Hoopsick et al., 2018a). The NDE assesses the constructs of *guilt*, *value*, *camaraderie*, and *connectedness* using a series of 4 questions: "Do/Did you feel guilty for not having been deployed?" "Do/Did you feel less valuable as a member of your unit because you have not been deployed?" "Do/Did you feel less camaraderie with your unit because you have not been deployed?" and "Do/Did you feel less connected with your unit because you have not been deployed?" Questions are scored 0 to 4 on a Likert scale with responses ranging from "Not at all" to "Extremely." Summary scores range from 0 to 16, with higher scores indicating more negative emotions regarding nondeployment. Psychometric testing of the NDE demonstrated that all constructs are positively correlated with each other and that this instrument is able to well discriminate between soldiers that have low, moderately, and highly negative nondeployment emotions (Hoopsick et al., 2018a). The NDE had high reliability in our sample for both men and women ($\alpha_{men} = 0.90$, $\alpha_{women} = 0.93$).

Sex. Soldiers self-reported sex at the baseline assessment.

Covariates. Several variables were included in the adjusted analyses that were likely to confound the relation between nondeployment emotions and alcohol use: years of military service at baseline, current number of close military friends in social network, current marital satisfaction, and current depression symptomatology. Years of military service included the total years of active duty service (if applicable) and years of Reserve/Guard service. Consistent with other work (Homish and Leonard, 2008), military social network friends were identified as those currently serving in any branch of the military and who the participant defined as someone who provided him or her with emotional support, someone with whom he or she socialized regularly, someone who helped him or her with practical or financial problems, and/or someone who was important to him or her. Previous work has demonstrated that marital satisfaction is a strong protective factor against the effects of military-related stress on poor mental health (Vest et al., 2017) and alcohol problems (Vest et al., 2018). We used the Marital Adjustment Test (MAT) (Locke and Wallace, 1959), a 15-item Likert-based scale, to assess marital satisfaction. Questions include the extent of agreement with their spouse and degree of happiness that the individual has in their relationship. Responses to each question are summed for a total relationship satisfaction score, and higher scores indicate a stronger marriage/romantic partnership. We dichotomized marital satisfaction score into low (values under 100) and high (100 to 158), as scores under 100 indicate moderately to severely distressed relationships (Locke and Wallace, 1959). The MAT had good reliability in our sample ($\alpha_{men} = 0.76$, $\alpha_{women} = 0.79$). Our prior work showed that more negative nondeployment emotions were associated with more severe depression symptomatology (Hoopsick et al., 2018a), and the association between depression and alcohol misuse has also been demonstrated among military populations (Calhoun et al., 2018; Fetzner et al., 2013). To account for the potential confounding effects of depression, we assessed for soldiers' depression symptomatology using the PHQ-8 (Kroenke et al., 2009). This measure assesses the frequency that the respondent has experienced symptoms of depression over the last 2 weeks, such as "Feeling down, depressed, or hopeless" and "Feeling bad about yourself." The PHQ-8 had high internal consistency in our sample ($\alpha_{men} = 0.90$, $\alpha_{women} = 0.91$).

Analytic Plan

We performed all analyses using Stata version 15.1 software (Stata Corporation, College Station, TX). Descriptive statistics were used to characterize the study sample. We examined the cross-sectional effects of negative emotions related to nondeployment on 4 alcohol use outcomes: alcohol problems, the frequency of getting drunk, the typical number of drinks consumed during a drinking episode, and the percent of days drinking. Alcohol problems, the frequency of getting drunk, and the typical number of drinks consumed are count variables that can only take nonnegative integer values in a limited range; therefore, we used negative binomial regression models to examine their relations with nondeployment emotions. Risk ratios (RRs) and 95% confidence intervals (CIs) are reported. Given that the percent of days drinking was expressed as a proportion, we examined the relation between nondeployment emotions and percent of days drinking using fractional logistic regression models (Baum, 2008; Papke and Wooldridge, 1996). Odds ratios (ORs) and 95% CIs are reported. All models were then adjusted for the effects of years of military service, number of close military friends in social network, marital satisfaction, and depression. We examined the interaction effects of nondeployment emotions and sex by adding an interaction term to each of the final adjusted models. To further explain significant interaction effects, predictive margins were calculated at the tenth and ninetieth percentile NDE score to examine the difference in alcohol use outcomes between those with the lowest and highest levels of negative emotions related to nondeployment. Predictive margins for significant interactions were then displayed via figure for clarity. All unadjusted, adjusted, and interaction models were each bootstrapped with 1,000 replications to enhance the accuracy of inferences made with this sample size.

RESULTS

Descriptive Results

Among never-deployed USAR/NG soldiers, mean summary NDE scores were 4.07 (standard deviation [SD] = 4.10, range 0 to 16) for male soldiers and 4.70 (SD = 4.80, range 0 to 15) for female soldiers. Negative emotions related to nondeployment were prevalent in our sample; 77% of male soldiers and 70% of female soldiers experienced some negative nondeployment emotions (feelings of guilt, decreased value, decreased camaraderie, and/or decreased connectedness) for having never been deployed. The distribution of NDE Questionnaire responses by sex is presented in Table 2. Mean (SD) AUDIT scores were 4.03 (3.65) for men and 3.21 (2.84) for women, with an overall range of 0 to 20 in our sample. Additionally, 12% of men and 8% of women had an AUDIT score ≥8, indicative of clinically significant alcohol problems (Babor et al., 2001). Among never-deployed soldiers, 23% of men and 21% of women reported getting drunk at least once per month. Male soldiers reported typically consuming a mean (SD) of 2.54 (1.23) drinks at a single setting and 17% reported drinking on at least half of the days in the last year. Similarly, female soldiers reported typically consuming a mean (SD) of 2.22 (0.73) drinks at a single setting and 13% reported drinking on at least half of the days in the last year.

Main Effects of Nondeployment Emotions

To examine the relation between nondeployment emotions and each of the 4 alcohol use behavior outcomes separately, we ran unadjusted bootstrapped regression models as well as

Table 2. Distribution of Non-Deployment Emotions Questionnaire Responses by Sex Among Never-Deployed U.S. Army Reserve and National Guard Soldiers

Item	Question	Mean (SD) [range]	0—Not at all % (*N*)	1—A little bit % (*N*)	2—Moderately % (*N*)	3—Quite a bit % (*N*)	4—Extremely % (*N*)
Male soldiers, *N* = 121							
Guilt	Do/Did you feel guilty for not having been deployed?	1.3 (1.2) [0 to 4]	34.7% (42)	28.1% (34)	18.2% (22)	12.4% (15)	6.6% (8)
Value	Do/Did you feel less valuable as a member of your unit because you have not been deployed?	1.0 (1.2) [0 to 4]	43.8% (53)	28.1% (34)	13.2% (16)	9.9% (12)	5.0% (6)
Camaraderie	Do/Did you feel less camaraderie with your unit because you have not been deployed?	0.9 (1.1) [0 to 4]	50.4% (61)	26.5% (32)	12.4% (15)	7.4% (9)	3.3% (4)
Connectedness	Do/Did you feel less connected with your unit because you have not been deployed?	0.9 (1.1) [0 to 4]	49.6% (60)	27.3% (33)	13.2% (16)	5.8% (7)	4.1% (5)
Female soldiers, *N* = 53							
Guilt	Do/Did you feel guilty for not having been deployed?	1.2 (1.2) [0 to 4]	37.7% (20)	28.3% (15)	11.3% (6)	20.8% (11)	1.9% (1)
Value	Do/Did you feel less valuable as a member of your unit because you have not been deployed?	1.3 (1.3) [0 to 4]	35.9% (19)	24.5% (13)	17.0% (9)	15.1% (8)	7.6% (4)
Camaraderie	Do/Did you feel less camaraderie with your unit because you have not been deployed?	1.1 (1.4) [0 to 4]	52.8% (28)	17.0% (9)	5.7% (3)	18.9% (10)	5.7% (3)
Connectedness	Do/Did you feel less connected with your unit because you have not been deployed?	1.1 (1.3) [0 to 4]	50.9% (27)	18.9% (10)	7.6% (4)	17.0% (9)	5.7% (3)

SD, standard deviation.

adjusted bootstrapped regression models controlling for years of military service, number of close military friends in social network, marital satisfaction, and depression. Results from these analyses are presented in Table 3.

Alcohol Problems. In our unadjusted model, more negative nondeployment emotions were associated with alcohol problems (RR = 1.05, 95% CI: 1.02, 1.08; $p < 0.01$). This association held in our adjusted model after controlling for years of military service, number of close military friends in social network, marital satisfaction, and depression (aRR = 1.04, 95% CI: 1.01, 1.07; $p < 0.05$).

Frequency of Getting Drunk. More negative nondeployment emotions were associated with a greater frequency of getting drunk in our unadjusted model (RR = 1.03, 95% CI: 1.01, 1.05; $p < 0.05$). This association persisted in our adjusted model controlling for years of military service, number of close military friends in social network, marital satisfaction, and depression (aRR = 1.02, 95% CI: 1.01, 1.04; $p < 0.05$).

Typical Number of Drinks. More negative nondeployment emotions were associated with a greater number of typical drinks consumed at a single setting (RR = 1.02, 95% CI: 1.01, 1.04; $p < 0.01$). The association between negative nondeployment emotions and the number of typical drinks consumed at a single setting persisted in our adjusted model controlling for years of military service, number of close military friends in social network, marital satisfaction, and depression (aRR = 1.03, 95% CI: 1.01, 1.04; $p < 0.01$).

Percent of Days Drinking. In our unadjusted model, more negative nondeployment emotions were also associated with a greater percent of days drinking (OR = 1.07, 95% CI: 1.02, 1.13; $p < 0.01$). After controlling for years of military service, number of close military friends in social network, marital satisfaction, and depression in our adjusted model, this association had trend-level significance (aOR = 1.05, 95% CI: 1.00, 1.11; $p = 0.055$).

Interaction Effects of Nondeployment Emotions and Soldier's Sex

To examine the potential effects of an interaction between nondeployment emotions and sex, an interaction term was added to each bootstrapped regression model. Predictive margins were also calculated for statistically significant models to determine the stratum-specific interactions between NDE score and sex on measures of alcohol use.

Alcohol Problems. Nondeployment emotions had a significant interaction with sex ($p < 0.05$); see Table 4. Predictive margins show that never-deployed soldiers had greater alcohol problems when they reported more negative nondeployment emotions and were male (Fig. 1). Nondeployment emotions had no effect on alcohol problems for never-deployed female USAR/NG soldiers.

Table 3. Effects of Nondeployment Emotions, Years of Military Service, Number of Close Military Friends in Social Network, Marital Satisfaction, and Depression on Alcohol Use Behaviors Among Never-Deployed U.S. Army Reserve and National Guard Soldiers

	Alcohol problems RR [95% CI]		Frequency of getting drunk RR [95% CI]		Typical number of drinks RR [95% CI]		Percent of days drinking OR [95% CI]	
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Nondeployment emotions	1.05** [1.02, 1.08]	1.04* [1.01, 1.07]	1.03* [1.01, 1.05]	1.02* [1.01, 1.04]	1.02** [1.01, 1.04]	1.03** [1.01, 1.04]	1.07** [1.02, 1.13]	1.05 [1.00, 1.11]
Years of military service		1.00 [0.97, 1.03]		0.98 [0.96, 1.01]		0.99 [0.97, 1.02]		1.04 [0.97, 1.11]
Military friends in social network		0.96 [0.86, 1.08]		0.98 [0.90, 1.07]		1.01 [0.95, 1.08]		1.09 [0.88, 1.35]
Marital satisfaction		0.94 [0.61, 1.42]		0.86 [0.68, 1.09]		1.12 [0.94, 1.34]		0.61 [0.32, 1.18]
Depression		1.03 [0.99, 1.08]		1.03* [1.01, 1.06]		1.00 [0.97, 1.03]		1.03 [0.97, 1.09]

RR, risk ratio; OR, odds ratio.
*$p < 0.05$, **$p < 0.01$.

Frequency of Getting Drunk. There was no significant interaction between nondeployment emotions and sex on the frequency of getting drunk.

Typical Number of Drinks. There was no significant interaction between nondeployment emotions and sex on typical number of drinks consumed at a single setting.

Percent of Days Drinking. There was no significant interaction between nondeployment emotions and sex on the percent of days drinking in the last year.

DISCUSSION

This research provides important information about the relations between negative emotions related to nondeployment and a range of alcohol use outcomes among a sample of never-deployed USAR/NG soldiers, a highly understudied, but high-risk population. Our findings demonstrate that among male USAR/NG soldiers, more negative nondeployment emotions are associated with greater alcohol problems, but there was no relation between nondeployment emotions and alcohol problems among female soldiers. Although the interaction term coefficients for the remaining alcohol use outcomes were not statistically significant, the magnitude and directionality were also suggestive of a relation between nondeployment emotions and alcohol use outcomes for men, but not for women. Given that the number of Reserve service members enlisted in the U.S. military exceeds 1 million, the greatest proportion of which are male USAR/NG soldiers (Department of Defense, 2013), and that many of these soldiers may not deploy, it is critical to gain a better understanding of the factors that might contribute to alcohol misuse in this high-risk population.

Negative emotions related to nondeployment are particularly relevant among USAR/NG soldiers when considering the context of Reserve identity, of which deployment and group membership are central components (Griffith, 2011). Not being deployed is in direct contrast to the Reserve soldier identity (Griffith, 2011) and may contribute to additional stress among never-deployed soldiers (Hoopsick et al., 2018a). Likewise, the time spent with his or her unit for the never-deployed soldier is limited; Reserve/Guard soldiers typically perform 39 days of military service annually and participate in monthly weekend drills and several days of training (Griffith, 2010), while those that are deployed may serve a year or more with their unit (Adler et al., 2005). These experiences, or lack thereof, likely contribute to the soldier's perceived feelings of value, camaraderie, and connectedness within his or her unit. Our findings demonstrate that a substantial proportion of never-deployed USAR/NG soldiers reported feeling some negative emotions regarding nondeployment (feelings of guilt, decreased value, decreased camaraderie, and/or decreased connectedness). Although relatively few soldiers reported *extremely* negative nondeployment emotions, our findings show that these emotions are

related to alcohol use behaviors and alcohol problems among male soldiers.

Although PTSD is often studied in the context of combat experiences (Smith et al., 2008), even never-deployed soldiers may be susceptible to traumatic stress. Emerging evidence suggests that individuals who have never personally experienced a traumatic event can be negatively impacted via "vicarious trauma"; our recent work (Fillo et al., 2018) demonstrated that civilian spouses of USAR/NG soldiers with a history of combat deployment experienced PTSD symptomology, despite never personally experiencing a prior traumatic event. Furthermore, these symptoms were associated with alcohol use, frequent heavy drinking, and alcohol problems among these civilian spouses. Similarly, work by Homish and colleagues (2012) demonstrated that firefighters experienced greater alcohol consumption in the time period following a large community-level disaster despite not actually responding to the event. Like soldiers, first responders share a willingness to face danger and help one another (Crosby, 2007), and this type of social connectedness may contribute to the contagious nature of negative emotional states and behaviors (Fletcher, 2009). Although our work is consistent with other previous works, it is not known what factors contribute to negative emotions related to having never been deployed. Other research suggests that the "healthy warrior effect" may account for the symptomology experienced by never-deployed soldiers; greater problems with mental health have been associated with a lower likelihood of ever being deployed (Wilson et al., 2009). However, regardless of why never-deployed soldiers experience poor well-being, our findings are important to consider in the context of identification of alcohol misuse. Never-deployed soldiers may be at equally high risk compared to their deployed counterparts, but are less likely to be appropriately targeted for screening and intervention.

In addition to making a significant contribution to the literature on alcohol misuse among never-deployed soldiers, our findings highlight an important difference between male and female USAR/NG soldiers. Our findings showed that nondeployment emotions were only associated with alcohol problems among male soldiers. Results demonstrate that there is an interaction between nondeployment emotions and sex on alcohol problems. Never-deployed soldiers who were male had a significantly greater likelihood of alcohol problems when they also had highly negative nondeployment emotions, but this effect was not present for females. It is possible that not fulfilling the Reserve soldier identity (Griffith, 2011) due to having never been deployed may be more problematic for male soldiers compared to female soldiers.

In addition to differences in alcohol use patterns between males and females (SAMHSA, 2010, 2014), our findings might also be indicative of differences in cognitive and emotional qualities between men and women with respect to the effects of nondeployment on alcohol misuse. Despite comprising a smaller proportion of Reserve forces than men (Ryan et al., 2007), research has shown that female soldiers are just as resilient as male soldiers to the effects of combat trauma (Vogt et al., 2011). Further, women may be more likely than men to derive positive outcomes from a stressful event (i.e., nondeployment); research on the sex differences of psychological hardiness demonstrated that female soldiers

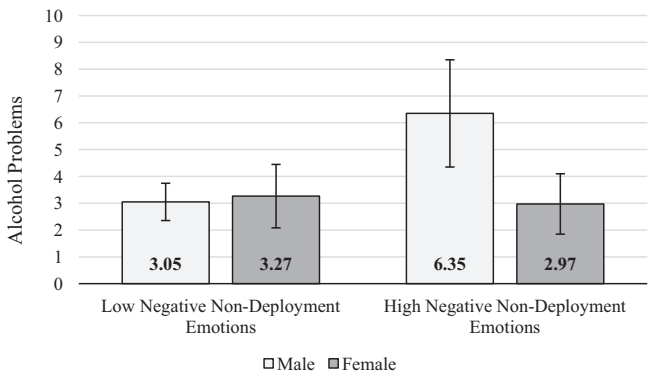

Fig. 1. Low Negative Nondeployment Emotions: NDE Score = 0; High Negative Nondeployment Emotions = 12.

Table 4. Interaction Effects of Nondeployment Emotions and Sex on Alcohol Use Behaviors, Controlling for Years of Military Service, Number of Close Military Friends in Social Network, Marital Satisfaction, and Depression Among Never-Deployed U.S. Army Reserve and National Guard Soldiers

	Alcohol problems RR [95% CI]	Frequency of getting drunk RR [95% CI]	Typical number of drinks RR [95% CI]	Percent of days drinking OR [95% CI]
Nondeployment emotions × sex				
Male	Referent	Referent	Referent	Referent
Female	0.93* [0.88, 0.99]	0.97 [0.93, 1.01]	0.98 [0.95, 1.01]	0.91 [0.81, 1.02]
Nondeployment emotions	1.06** [1.02, 1.10]	1.03* [1.01, 1.05]	1.03** [1.01, 1.06]	1.09* [1.02, 1.16]
Sex				
Male	Referent	Referent	Referent	Referent
Female	1.07 [0.70, 1.64]	1.05 [0.79, 1.40]	0.94 [0.78, 1.15]	1.31 [0.59, 2.88]
Years of military service	0.99 [0.96, 1.02]	0.98 [0.96, 1.01]	0.99 [0.97, 1.01]	1.03 [0.96, 1.10]
Military friends in social network	0.94 [0.84, 1.05]	0.97 [0.90, 1.05]	1.01 [0.95, 1.08]	1.06 [0.85, 1.32]
Marital satisfaction	0.97 [0.64, 1.45]	0.87 [0.69, 1.11]	1.13 [0.95, 1.34]	0.63 [0.32, 1.24]
Depression	1.03 [0.99, 1.08]	1.03* [1.01, 1.06]	1.00 [0.98, 1.03]	1.03 [0.97, 1.10]

RR, risk ratio.
*$p < 0.05$, **$p < 0.01$.

perceived more benefits as a result of being deployed than male soldiers (Britt et al., 2001). Thus, it is possible that although female soldiers experience negative emotions in response to never having been deployed, they may be more resilient and perceive more benefits from their nondeployment than their male counterparts, which might explain why there was no effect of nondeployment emotions on alcohol problems for women. Further, women are more likely than men to serve as a primary caregiver of children or other family members (Coltrane, 2000; Sharma et al., 2016). Given the responsibilities associated with caregiver status and a lack of support experienced by female service members who deploy (Goodman et al., 2013), women might be more likely to experience positive emotions related to nondeployment. Additionally, it was not until recently that women were eligible to serve in frontline combat roles (Rosenberg and Phillipps, 2015). Therefore, being deployed may be less central to the overall feelings of legitimacy and belonging of female soldiers than among male soldiers. Longitudinal work is needed to further examine the sex-specific effects of nondeployment emotions on alcohol problems.

Limitations and Strengths

This work is subject to some limitations. First, given that data were cross-sectional, we cannot conclude that nondeployment emotions contributed to worse alcohol use outcomes among never-deployed soldiers. Our findings were significant, but of consistently small magnitude. It is possible there may be common factors that increase the risk for more negative nondeployment emotions as well as greater alcohol misuse, which may account for the observed associations. Longitudinal research is needed to further examine the temporal relations between emotions related to having never been deployed and substance use outcomes among never-deployed soldiers. Second, as with all survey-based research, there is a potential for response bias. However, given the use of validated tools and the use of a confidential survey, the risk of social desirability bias was low. Last, all participants were either married or living as married at study enrollment. This may limit generalizability, but national data indicate that the majority of U.S. service members are married (Office of the Deputy Assistant Secretary of Defense for Military Community and Family Policy, 2015). Further research is needed to examine the potential role of nondeployment emotions in other military populations. Additionally, potential positive emotions related to nondeployment are important to consider in future work.

This research also has several strengths that should also be noted. First, our findings make a significant contribution to the literature on 2 high-risk, but understudied populations: USAR/NG and never-deployed service members. Additionally, much of the literature on military populations focuses only on male soldiers, but nearly one-third of our sample was female. Last, our work examined a range of alcohol use outcomes which allowed us to examine nuances in the relations between nondeployment emotions and alcohol misuse, and the extent to which sex modifies these relations.

CONCLUSION

Our findings demonstrate that, among never-deployed USAR/NG soldiers, more negative emotions related to never having been deployed were associated with a range of alcohol use outcomes, and that male USAR/NG soldiers were at greater risk for alcohol problems when they had highly negative nondeployment emotions. The NDE Questionnaire may complement existing screening tools used to identify high-risk populations. However, additional research is needed to examine its clinical utility. Furthermore, additional research is needed to examine relations between nondeployment emotions and substance use, longitudinally and across other branches of the military. This work underscores the importance of including never-deployed soldiers in alcohol screening and prevention efforts among military populations, especially soldiers who experience negative emotions related to having never been deployed.

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CONFLICT OF INTEREST

The authors have no conflict of interests to declare.

REFERENCES

Adler AB, Huffman AH, Bliese PD, Castro CA (2005) The impact of deployment length and experience on the well-being of male and female soldiers. J Occup Health Psychol 10:121–137.

Babor TF, Higgins-Biddle JC, Saunders JB, Monteiro MG (2001) AUDIT: The Alcohol Use Disorders Identification Test: Guidelines for Use in Primary Care. Department of Mental Health and Substance Dependence, World Health Organization, Geneva, Switzerland.

Baum CF (2008) Modeling proportions. Stata J 8:299–303.

Bravo AJ, Kelley ML, Hollis BF (2016) Work stressors, sleep quality, and alcohol-related problems across deployment: a parallel process latent growth modeling approach among Navy members. Stress Health 33:339–347.

Bray RM, Brown JM, Williams J (2013) Trends in binge and heavy drinking, alcohol-related problems, and combat exposure in the U.S. military. Subst Use Misuse 48:799–810.

Bray RM, Hourani LL (2007) Substance use trends among active duty military personnel: findings from the United States Department of Defense Health Related Behavior Surveys, 1980-2005. Addiction 102:1092–1101.

Bray RM, Pemberton MR, Lane ME, Hourani LL, Mattiko MJ, Babeu LA (2010) Substance use and mental health trends among U.S. military active duty personnel: key findings from the 2008 DoD Health Behavior Survey. Mil Med 175:390–399.

Britt TW, Adler AB, Bartone PT (2001) Deriving benefits from stressful events: the role of engagement in meaningful work and hardiness. J Occup Health Psychol 6:53–63.

Cahalan D, Cisin IH, Crossley HM (1969) American Drinking Practices; a National Study of Drinking Behavior and Attitudes. N.J. Publications Division Rutgers Center of Alcohol Studies distributed by College & University Press, New Haven, CT.

Calhoun PS, Wilson SM, Dedert EA, Cunningham KC, Burroughs TK, Hicks TA, Backham JC, Kudler HS, Straits-Troster K (2018) The association of alcohol consumption patterns with self-rated physical health and psychiatric distress among Afghanistan- and Iraq-era U.S. veterans. Psychiatry Res 259:142–147.

Cohen GH, Fink DS, Sampson L, Galea S (2015) Mental health among reserve component military service members and veterans. Epidemiol Rev 37:7–22.

Cohen GH, Fink DS, Sampson L, Tamburrino M, Liberzon I, Calabrese JR, Galea S (2016) Coincident alcohol dependence and depression increases risk of suicidal ideation among Army National Guard soldiers. Ann Epidemiol 27:157–163.

Coltrane S (2000) Research on household labor: modeling and measuring the social embeddedness of routine family work. J Marriage Family 62:1208–1233.

Crosby F (2007) The real meaning of brotherhood. Fire Eng 160:107–110.

Defense Manpower Data Center (2017) Counts of Active Duty and Reserve Service Members and APF Civilians. Department of Defense, Alexandria, VA.

Department of Defense (2013) Department of Defense 2012 Demographics: Profile of the Military Community [Online]. Available at: http://download.militaryonesource.mil/12038/MOS/Reports/2012_Demographics_Report.pdf. Accessed June 7, 2017.

Eisen SA, Griffith KH, Xian H, Scherrer JF, Fischer ID, Chantarujikapong S, Hunter J, True WR, Lyons MJ, Tsuang MT (2004) Lifetime and 12-month prevalence of psychiatric disorders in 8,169 male Vietnam War era veterans. Mil Med 169:896–902.

Fetzner MG, Abrams MP, Asmundson GJ (2013) Symptoms of posttraumatic stress disorder and depression in relation to alcohol-use and alcohol-related problems among Canadian forces veterans. Can J Psychiatry 58:417–425.

Fillo J, Kulak JA, Vest BM, Homish DL, Homish GG (2018) Mental and behavioral health sequelae of vicarious trauma symptoms among spouses of U.S. military service members. *Society of Behavioral Medicine*. New Orleans, LA.

Fink DS, Gallaway MS, Tamburrino MB, Liberzon I, Chan P, Cohen GH, Sampson L, Shirley E, Goto T, D'Arcangelo N, Fine T, Reed PL, Calabrese JR, Galea S (2016) Onset of alcohol use disorders and comorbid psychiatric disorders in a military cohort: are there critical periods for prevention of alcohol use disorders? Prev Sci 17:347–356.

Fletcher J (2009) All in the family: mental health spillover effects between working spouses. BE J Econ Anal Policy 9:1–19.

Goodman P, Turner A, Agazio J, Throop M, Padden D, Greiner S, Hillier SL (2013) Deployment of military mothers: supportive and nonsupportive military programs, processes, and policies. Mil Med 178:729–734.

Green KT, Beckham JC, Youssef N, Elbogen EB (2014) Alcohol misuse and psychological resilience among U.S. Iraq and Afghanistan era veterans. Addict Behav 39:406–413.

Griffith J (2010) Citizens coping as soldiers: a review of deployment stress symptoms among reservists. Mil Psychol 22:176–206.

Griffith J (2011) Decades of transition for the US reserves: changing demands on reserve identity and mental well-being. Int Rev Psychiatry 23:181–191.

Hoge CW, Auchterlonie JL, Milliken CS (2006) Mental health problems, use of mental health services, and attrition from military service after returning from deployment to Iraq or Afghanistan. JAMA 295:1023–1032.

Homish GG, Frazer BS, Carey MG (2012) The influence of indirect collective trauma on first responders alcohol use. Int J Emerg Mental Health 14:21–28.

Homish GG, Leonard KE (2008) The social network and alcohol use. J Stud Alcohol Drugs 69:906–914.

Hoopsick RA, Fillo J, Vest BM, Homish DL, Homish GG (2017) Substance use and dependence among current reserve and former military members: cross-sectional findings from the National Survey on Drug Use and Health, 2010-2014. J Addict Dis 36:243–251.

Hoopsick RA, Homish DL, Bartone PT, Homish GG (2018a) Developing a measure to assess emotions associated with never being deployed. Mil Med doi: 10.1093/milmed/usy005 [Epub ahead of print].

Hoopsick RA, Vest BM, Homish DL, Homish GG (2018b) Combat exposure, emotional and physical role limitations, and substance use among male United States Army Reserve and National Guard soldiers. Qual Life Res 27:137–147.

Hotopf M, Hull L, Tfear N, Browne T, Horn O, Iversen A, Jones M, Murphy D, Bland D, Earnshaw M, Greenberg N, Hughes JH, Tate AR, Dandeker C, Rona R, Wessely S (2006) The health of UK military personnel who deployed to the 2003 Iraq war: a cohort study. Lancet 367:1731–1741.

Hutson SP, Hall JM, Pack FL (2015) Survivor guilt: analyzing the concept and its contexts. ANS Adv Nurs Sci 38:20–33.

Jacobson IG, Ryan MA, Hooper TI, Smith TC, Amoroso PJ, Boyko EJ, Gackstetter GD, Wells TS, Bell NS (2008) Alcohol use and alcohol-related problems before and after military combat deployment. J Am Med Assoc 300:663–675.

Kline A, Ciccone DS, Weiner M, Interian A, St Hill L, Falca-Dodson M, Black CM, Losonczy M (2013) Gender differences in the risk and protective factors associated with PTSD: a prospective study of National Guard troops deployed to Iraq. Psychiatry 76:256–272.

Kroenke K, Strine TW, Spitzer RL, Williams JBW, Berry JT, Mokdad AH (2009) The PHQ-8 as a measure of current depression in the general population. J Affect Disord 114:163–173.

Locke HJ, Wallace KM (1959) Short marital-adjustment and prediction tests: their reliability and validity. Marriage Family Living 21:251–255.

Luoma J, Guinther P, Potter J, Cheslock M (2017) Experienced-based versus scenario-based assessments of shame and guilt and their relationship to alcohol consumption and problems. Subst Use Misuse 52:1692–1700.

Milliken CS, Auchterlonie JL, Hoge CW (2007) Longitudinal assessment of mental health problems among active and reserve component soldiers returning from the Iraq War. J Am Med Assoc 298:2141–2148.

Office of the Deputy Assistant Secretary of Defense for Military Community and Family Policy (2015) 2015 Demographics Profile of the Military Community. Department of Defense, Washington, DC.

Papke LE, Wooldridge J (1996) Econometric methods for fractional response variables with an application to 401(k) plan participation rates. J Appl Econ 11:619–632.

Platteborze PL, Kippenberger DJ, Martin TM (2013) Drug positive rates for the Army, Army Reserve, and Army National Guard from fiscal year 2001 through 2011. Mil Med 178:1078–1084.

Rosenberg M, Phillipps D (2015) All combat roles now open to women defense secretary says. *New York Times*, Dec. 3.

Rundell JR (2006) Demographics of and diagnoses in Operation Enduring Freedom and Operation Iraqi Freedom personnel who were psychiatrically evacuated from the theater of operations. Gen Hosp Psychiatry 28:352–356.

Ryan MA, Smith TC, Smith B, Amoroso P, Boyko EJ, Gray GC, Gackstetter GD, Riddle JR, Wells TS, Gumbs G, Corbeil TE, Hooper TI (2007) Millennium Cohort: enrollment begins a 21-year contribution to understanding the impact of military service. J Clin Epidemiol 60:181–191.

Salvatore JE, Cho SB, Dick DM (2017) Genes, environments, and sex differences in alcohol research. J Stud Alcohol Drugs 78:494–501.

SAMHSA (2010) Female veterans aged 20-39 less likely to use most substances than male counterparts. Data spotlight. Substance Abuse and Mental Health Services Administration, Rockville, MD.

SAMHSA (2014) Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings. Substance Abuse and Mental Health Services Administration, Rockville, MD.

Saunders J, Aasland O, Babor T, de la Fuente J, Grant M (1993) Development of the alcohol use disorders identification test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption-II. Addiction 88:791–804.

Sayko Adams R, Corrigan JD, Mohr BA, Williams TV, Larson MJ (2017) Traumatic brain injury and post-deployment binge drinking among male and female army active duty service members returning from operation enduring freedom/operation Iraqi Freedom. J Neurotrauma 34:1457–1465.

Seal KH, Bertenthal D, Miner CR, Sen S, Marmar C (2007) Bringing the war back home: mental health disorders among 103,788 US veterans returning from Iraq and Afghanistan seen at Department of Veterans Affairs facilities. Arch Intern Med 167:476–482.

Seal KH, Cohen G, Waldrop A, Cohen BE, Maguen S, Ren L (2011) Substance use disorders in Iraq and Afghanistan veterans in VA healthcare, 2001-2010: implications for screening, diagnosis and treatment. Drug Alcohol Depend 116:93–101.

Sharma N, Chakrabarti S, Grover S (2016) Gender differences in caregiving among family—caregivers of people with mental illnesses. World J Psychiatry 6:7–17.

Smith T, Ryan M, Wingard D, Slymen D, Sallis J, Kritz-Silverstein D (2008) New onset and persistent symptoms of post-traumatic stress disorder self reported after deployment and combat exposures: prospective population based US military cohort study. BMJ 336:366.

Thomas JL, Wilk JE, Riviere LA, McGurk D, Castro CA, Hoge CW (2010) Prevalence of mental health problems and functional impairment among active component and national guard soldiers 3 and 12 months following combat in Iraq. Arch Gen Psychiatry 67:614–623.

Trautmann S, Schonfeld S, Behrendt S, Hofler M, Zimmermann P, Wittchen HU (2014) Substance use and substance use disorders in recently deployed and never deployed soldiers. Drug Alcohol Depend 134:128–135.

Vasterling JJ, Proctor SP, Friedman MJ, Hoge CW, Heeren T, King LA, King DW (2010) PTSD symptom increases in Iraq-deployed soldiers: comparison with nondeployed soldiers and associations with baseline symptoms, deployment experiences, and postdeployment stress. J Trauma Stress 23:41–51.

Vest BM, Heavey SC, Homish DL, Homish GG (2017) Marital satisfaction, family support, and pre-deployment resiliency factors related to mental health outcomes for reserve and National Guard Soldiers. Mil Behav Health 5:313–323.

Vest BM, Homish DL, Hoopsick RA, Homish GG (2018) What drives the relationship between combat and alcohol problems in soldiers? The roles of perception and marriage. Soc Psychiatry Psychiatr Epidemiol 53:413–420.

Vogt D, Vaughn R, Glickman ME, Schultz M, Drainoni M-L, Elwy R, Eisen S (2011) Gender differences in combat-related stressors and their association with postdeployment mental health in a nationally representative sample of U.S. OEF/OIF veterans. J Abnorm Psychol 120:797–806.

Waller M, McGuire AC, Dobson AJ (2015) Alcohol use in the military: associations with health and wellbeing. Subst Abuse Treat Prev Policy 10:27. Available at: https://substanceabusepolicy.biomedcentral.com/articles/10.1186/s13011-015-0023-4. Accessed October 23, 2018.

Walsh K, Koenen KC, Cohen GH, Ursano R, Gifford RK, Fullerton CS, Galea S (2014) Sexual violence and mental health symptoms among National Guard and Reserve soldiers. J Gen Intern Med 29:104–109.

Wells TS, Leardmann CA, Fortuna SO, Smith B, Smith TC, Ryan MA, Boyko EJ, Blazer D (2010) A prospective study of depression following combat deployment in support of the wars in Iraq and Afghanistan. Am J Public Health 100:90–99.

Wilson J, Jones M, Fear NT, Hull L, Hotopf M, Wessely S, Rona RJ (2009) Is previous psychological health associated with the likelihood of Iraq War deployment? An investigation of the "healthy warrior effect." Am J Epidemiol 169:1362–1369.

Wright KM, Foran HM, Wood MD, Eckford RD, McGurk D (2012) Alcohol problems, aggression, and other externalizing behaviors after return from deployment: understanding the role of combat exposure, internalizing symptoms, and social environment. J Clin Psychol 68:782–800.