

Resilience to Hazardous Drinking Among Never-Deployed Male United States Army Reserve and National Guard Soldiers

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Background: Negative emotions related to never having been deployed to active duty are associated with an increased risk of hazardous drinking among United States Army Reserve/National Guard (USAR/NG) soldiers. Resiliency factors are known to buffer the effects of combat on hazardous drinking among service members who have been deployed, but it is not known whether these factors are protective for never-deployed service members, or which domains of hazardous drinking might be affected. Therefore, we examined the effects of a range of resiliency factors (i.e., marital satisfaction, psychological hardiness, intrinsic religiosity) on the relation between nondeployment emotions (NDE) and domains of hazardous drinking.

Methods: We drew a subset of data from Operation: Soldiers and Families Excelling Through the Years ($N = 112$ never-deployed male soldiers), an ongoing study of USAR/NG soldiers. Regression models examined the main effects of NDE on each of the domains of hazardous drinking (i.e., total Alcohol Use Disorders Identification Test [AUDIT] score, consumption subscale, dependence subscale, alcohol-related problems subscale) and effect modification of each of the resiliency factors on the relations between NDE and the domains of hazardous drinking, separately. Final models controlled for years of military service, rank (enlisted vs. officer), number of military friends in the social network, and depression.

Results: Greater NDE were associated with a higher total AUDIT score, alcohol consumption, and alcohol dependence ($ps < 0.05$), but not alcohol-related problems ($p > 0.05$). Marital satisfaction and psychological hardiness buffered the effects of NDE on total AUDIT score and alcohol dependence ($p < 0.05$). Intrinsic religiosity only modified the effect of NDE on total AUDIT score. None of the resiliency factors modified the effects of NDE on alcohol consumption or alcohol-related problems.

Conclusions: Soldiers with greater NDE had a greater risk of hazardous drinking in the presence of low resilience. Interventions to promote resiliency are an important consideration for protecting USAR/NG soldiers from hazardous drinking, *regardless* of their deployment history.

Key Words: Military, Nondeployment Emotions, Hazardous Drinking, Resilience.

MILITARY SERVICE MEMBERS have a heightened 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). Although there is an abundance of literature demonstrating the deleterious effects of combat deployment on alcohol misuse (Bray and Hourani, 2007;

Green et al., 2014; Hoge et al., 2006; Hoopsick et al., 2018; Jacobson et al., 2008; Milliken et al., 2007; Seal et al., 2011; Vest et al., 2018; Wright et al., 2012), a growing body of evidence also suggests that there are no significant differences between previously 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 (Hoopsick et al., 2019; Trautmann et al., 2014). However, little attention is given to service members who have never experienced deployment—in terms of both military-related research and interventions for current and former service members. Never-deployed service members represent a highly understudied population at risk for hazardous drinking and alcohol-related sequelae. Therefore, it is critical to understand what factors might promote resilience and facilitate improved outcomes for this military subgroup.

National Guard and Reserve Populations

Although they have similar military roles and combat experiences, research has shown that Reserve/Guard soldiers

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Received for publication October 5, 2020; accepted January 19, 2021.

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DOI: 10.1111/acer.14561

are at greater risk for problems with substance use and mental health than their active duty counterparts (Cohen et al., 2015; Griffith, 2010; Hotopf et al., 2006; Jacobson et al., 2008; Milliken et al., 2007; Rundell, 2006; Vasterling et al., 2010). Further, national prevalence estimates suggest that nearly 3-quarters of Reservists report past month alcohol use (Hoopsick et al., 2017). Reservists constitute more than one-third of the entire US military (Defense Manpower Data Center, 2017), the majority of whom serve in the United States Army Reserve/National Guard (USAR/NG; Office of the Deputy Assistant Secretary of Defense, 2016). While many Reserve/Guard service members may never deploy during their military tenure (Defense Manpower Data Center, 2017), much of the literature regarding alcohol misuse among Reservists focuses on the context of deployment.

Nondeployment Emotions

Deployment is an important part of soldier identity and group membership, both of which play a role in stress among service members (Griffith, 2011). Our prior work demonstrated that feelings of guilt, decreased value to one's unit, decreased camaraderie with one's unit, and decreased connectedness with one's unit as a result of never having been deployed, hereafter referred to as nondeployment emotions (NDE), are prevalent among never-deployed USAR/NG soldiers (Hoopsick et al., 2018a). Additionally, these NDE are associated with increased mental health symptomatology (Hoopsick et al., 2018a) and a range of alcohol use outcomes among USAR/NG soldiers, including hazardous drinking, the frequency of getting drunk, the percent of days drinking, and the typical number of drinks consumed in a single setting (Hoopsick et al., 2018b). Male USAR/NG soldiers appear to be more vulnerable to the effects of NDE; our prior work demonstrated that never-deployed soldiers who were male had a significantly greater likelihood of hazardous drinking when they also had highly negative NDE, but this effect was not observed in female soldiers (Hoopsick et al., 2018b).

Resilience to Hazardous Drinking

There is robust evidence demonstrating the effects of resiliency factors in preventing adverse outcomes among military personnel. Our work expands on the Bioecological Model of Deployment Risk and Resilience (Wooten, 2013), a military-informed biopsychosocial framework to understanding the relations between military-related risk factors (e.g., NDE), protective factors, and health-related outcomes of service members. Built on resilience theory, this model assumes that individuals are affected by cognitive and emotional appraisals and can change over time. This framework purports that service members affect and are affected by the ecological environment, and both risk and protective factors may originate at any point during the deployment disruption continuum (i.e., predeployment, perideployment,

postdeployment). These risk and protective factors work in opposing directions, ultimately influencing service members' health status. In the presence of protective factors, the effects of stress (e.g., NDE) can be buffered leading to a return to a homeostatic state or even an improved health status. In the absence of these resiliency factors, maladaptation and the development of health problems (e.g., hazardous drinking) are likely to occur. Much of the literature on military-related resilience focuses on mental health in the context of the post-deployment period. Never-deployed service members may also benefit from enhanced interpersonal and intrapersonal resiliency (Hoopsick et al., 2020). However, it is not known if any such factors buffer the effects of NDE on hazardous drinking.

Emerging literature suggests that interpersonal and intrapersonal resiliency factors are important to consider among USAR/NG, regardless of deployment history (Hoopsick et al., 2019, in press). Among civilian populations, marriage has been associated with declining alcohol use and less problem drinking (Leonard and Eiden, 2007). National data show that the majority of US service members are married (Office of the Deputy Assistant Secretary of Defense, 2016), and these service members tend to consume less alcohol and engage in less risky drinking than unmarried service members (Ferrier-Auerbach et al., 2009; Seal et al., 2011; Wilk et al., 2010). Beyond marital status alone, research has also demonstrated that marital satisfaction is an important resiliency factor among USAR/NG soldiers experiencing deployment (Vest et al., 2017, 2018). For example, among USAR/NG soldiers who had previously been deployed, greater marital satisfaction has been associated with less anger, anxiety, depression, and posttraumatic stress symptomatology (Vest et al., 2017). Importantly, marital satisfaction has been shown to buffer the effects of the perceived threat of combat exposure on alcohol problems in this high-risk population (Vest et al., 2018). However, it is not known if marital satisfaction also buffers the effects of NDE on alcohol problems among USAR/NG soldiers who have never been deployed—an equally at-risk population.

Modifiable intrapersonal factors are also important to consider. Dispositional resiliency, or psychological hardiness, has been the focus of significant military-related research (Bartone et al., 2012, 2016; Wooten, 2012). Individuals who exhibit greater psychological hardiness tend to interpret life experiences as interesting and worthwhile, something over which they can exert control, and challenging, thus presenting opportunities to learn and grow (Johnsen et al., 2009). Among service members, poor psychological hardiness has been associated with postdeployment problem drinking (Bartone et al., 2012, 2015). Our prior work demonstrated that psychological hardiness was important to promoting resiliency against psychosocial problems among USAR/NG soldiers (Hoopsick et al., 2019), regardless of deployment history. Further, psychological hardiness may be an even more important

protective factor among soldiers who have never been deployed than among soldiers who have previously been deployed (Hoopsick et al., 2020). However, it is not known if psychological hardiness is protective against hazardous drinking among USAR/NG soldiers who experience highly negative NDE.

In addition to psychological hardiness, religiosity is another intrapersonal factor that warrants further examination. In community civilian samples, greater religiosity/spirituality has been associated with a lower frequency of alcohol consumption (Churakova et al., 2017; Holt et al., 2015; Kathol and Sgoutas-Emch, 2017). A growing body of literature suggests that religiosity and/or spirituality may also be an important resiliency factor for service members (Benda, 2004; Bremault-Phillips et al., 2019; Ganocy et al., 2016; Sharma et al., 2017). For example, research conducted by Sharma and colleagues (2017) demonstrated that greater religious/spiritual beliefs were associated with a lower odds of alcohol use disorder and other mental health symptomatology among a large sample of US military veterans. Likewise, a study of National Guard soldiers showed a significant correlation between spiritual well-being and the prevalence of lifetime alcohol use disorder (Ganocy et al., 2016). It is important to understand what effect, if any, one's intrinsic religiosity has on the relation between NDE and hazardous drinking for service members who have never been deployed.

The Current Study

We aimed to expand and build upon our previous research regarding NDE (Hoopsick et al., 2018a) and its relation to hazardous drinking (Hoopsick et al., 2018b). In our prior work (Hoopsick et al., 2018b), we examined the effects of NDE on a range of alcohol use measures. Findings from that study demonstrated that greater NDE were associated with higher total Alcohol Use Disorders Identification Test (AUDIT) scores among male, but not female, USAR/NG soldiers. However, that study did not examine the potential buffering effects of protective factors, and it remains unknown which *domains* of hazardous drinking might be most affected by NDE. Given that our prior work only showed a significant effect of NDE on hazardous drinking among male soldiers, the current study focuses on a sample of never-deployed *male* soldiers only ($N = 112$) drawn from Operation: Soldiers and Families Excelling Through the Years (SAFETY), an ongoing survey-based study that examines the health and well-being of USAR/NG soldiers and their partners. Here, we cross-sectionally examined if marital satisfaction, psychological hardiness, and intrinsic religiosity had any effect on the relation between NDE and the separate domains of hazardous drinking identified by the AUDIT. We hypothesized that each of these resiliency factors, separately, would buffer the effects of NDE on hazardous drinking.

MATERIALS AND METHODS

Participants and Recruitment

This research 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. After approval, we recruited USAR/NG soldiers and their partners from 47 units across New York state over a 15-month period (summer of 2014–fall of 2015). The military occupational specialties of these units were diverse and included combat, medical, logistics, and support roles. Participation in Operation: SAFETY involved the completion of yearly online surveys covering a variety of general health topics. We screened participants on 6 inclusion criteria: (i) The couple was married or living as if married; (ii) 1 member of the couple was a current USAR/NG 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 these couples ($N = 472$ couples, 65% of those eligible) completed some part of the survey. Surveys were included only if both partners completed follow-up ($N = 418$ couples). In the current study, we examined a subset of cross-sectional data from Operation: SAFETY that included male USAR/NG soldiers who reported never having been deployed at the first follow-up assessment, which was the first time point that included questions related to NDE.

Participants in the current substudy ($N = 112$ never-deployed male USAR/NG soldiers who were with partners at the 1-year follow-up) had a mean (\pm SD) age of 29.6 (\pm 5.9) years and were predominantly non-Hispanic White with at least some college education (Table 1). These soldiers had a median annual household income of \$40,000 to \$59,999 and most were enlisted in rank. On average, these never-deployed soldiers had served 5.6 (\pm 4.0) years in the military, and the majority identified as having no friends in their social network who were also currently serving in the military. Approximately 12% of these never-deployed male USAR/NG soldiers endorsed symptoms consistent with mild or worse depression.

Procedure

All participants completed an informed consent process before accessing the baseline survey. Surveys were administered and encrypted with the HIPAA-compliant survey programming software, StudyTrax™. 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 current study examines a subset of cross-sectional data from the first follow-up survey.

Measures

Hazardous Drinking. We used the AUDIT to assess hazardous drinking and its domains (Babor and Del Boca, 1992; Saunders et al., 1993). This 10-item measure consists of questions about current alcohol consumption, symptoms of alcohol dependence, and alcohol-related problems. Questions are 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 ($\alpha = 0.78$). Total AUDIT and subscale (i.e., alcohol consumption [3 items], alcohol dependence [3 items], alcohol-related problems [4 items]) scores were entered as count variables in all analyses.

Table 1. Characteristics of Never-Deployed Male USAR/NG Soldiers (N = 112)

	Mean (\pm SD) or % (n)
Age, years	29.6 (\pm 5.9)
Race-ethnicity	
Non-Hispanic white	75.9% (85)
Non-Hispanic black	8.9% (10)
Hispanic	8.0% (9)
Other	5.4% (6)
Education	
High school	17.0% (19)
Some college	49.1% (55)
College degree	33.9% (38)
Annual household income	
Less than \$19,999	7.1% (8)
\$20,000 to \$39,999	25.9% (29)
\$40,000 to \$59,999	24.1% (27)
\$60,000 to \$79,999	19.6% (22)
\$80,000 to \$99,999	8.9% (10)
\$100,000 to \$119,999	7.1% (8)
\$120,000 or more	6.3% (7)
Years of military service	5.6 (\pm 4.0)
Rank	
Enlisted	78.6% (88)
Officer	15.2% (17)
Number of military friends in the social network	
0 friends	58.9% (66)
1 friend	27.7% (31)
2 friends	6.3% (7)
3 friends	4.5% (5)
4 friends	1.8% (2)
5 friends	0.9% (1)
Depression (PHQ-8) score	2.3 (\pm 3.9)

PHQ-8, Patient Health Questionnaire 8-item; SD, standard deviation; USAR/NG, United States Army Reserve/National Guard.

NDE. We assessed negative emotions related to never having been deployed with the 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 NDE. Psychometric testing of the NDE demonstrated that all constructs are positively correlated with each other and that this instrument can effectively discriminate between soldiers who have low, moderate, and highly negative NDE (Hoopsick et al., 2018a). The NDE showed high reliability in our sample ($\alpha = 0.91$) and was entered as a count variable in all analyses.

Marital Satisfaction. We assessed relationship functioning with the Marital Adjustment Test (Locke and Wallace, 1959). This 15-item scale has been well-validated in measuring overall marital satisfaction and adjustment of partners to each other. Questions include the extent of agreement with their spouse and the degree of happiness that the individual has in their relationship. Responses to each question are summed for a total relationship satisfaction score ranging from 2 to 158, with higher scores indicating a stronger marriage/romantic partnership ($\alpha = 0.77$). Example items include the following: “degree of happiness” in the current relationship, level of partner agreement on the handling of family finances, sex relations, and

philosophy of life, and if the participant would marry/get involved with the same person if they “had his life to live over again.” We entered marital satisfaction as a count variable.

Psychological Hardiness. We assessed psychological hardiness with the 15-item Dispositional Resiliency Scale (DRS-15; Bartone, 1999, 2007). This measure includes subscales for commitment, control, and challenge, with responses ranging from “Not at all true” to “Completely true.” Example items include the following: “Most of my life gets spent doing things that are meaningful” (commitment), “By working hard you can nearly always achieve your goals” (control), and “I enjoy the challenge when I have to do more than 1 thing at a time” (challenge). Responses are summed for a total psychological hardiness score ranging from 0 to 45, with higher scores indicating greater dispositional resiliency. In our sample, the measure had good internal reliability ($\alpha = 0.79$) and was entered as a count variable.

Intrinsic Religiosity. We assessed intrinsic religiosity with the intrinsic religiosity subscale of the Duke University Religion Index (DUREL), a 5-item measure of religiosity developed for epidemiological studies (Koenig and Büssing, 2010). The intrinsic religiosity subscale of the DUREL consists of 3 items scored on a Likert scale with responses ranging from “Definitely not true” to “Definitely true of me.” Items include “In my life, I experience the presence of the Divine (i.e., God),” “My religious beliefs are what really lie behind my whole approach to life,” and “I try hard to carry my religion over into all other dealings in life.” Subscale scores range from 3 to 15, with higher scores indicating greater intrinsic religiosity or degree of personal religious commitment or motivation. The DUREL had good internal reliability in our sample ($\alpha = 0.90$). We included intrinsic religiosity as a count variable.

Covariates. To control for potential confounding effects, we included years of military service, rank (enlisted vs. officer), number of military friends in the social network, and depression in our adjusted models. At baseline, we asked soldiers to report the number of years of active duty service (if applicable) and years of Reserve/Guard service and we created a cumulative sum across all branches. Additionally, soldiers also reported current military rank at each assessment, which was coded to enlisted versus officer. Greater time-in-service may buffer the effects of deployment among service members; a recent study demonstrated that soldiers were more likely to attempt suicide when they were deployed within the first 12 months of service compared to when they were deployed after this time period (Ursano et al., 2018). Consistent with social network studies (Homish and Leonard, 2008), military friends in the social network were identified as those currently serving in any branch of the military and who the participant defined as someone who provided them with emotional support, someone with whom they socialized regularly, someone who helped them with practical or financial problems, and/or someone who was important to them. Other research from Operation: SAFETY demonstrated that having social network ties who were in the military was protective against alcohol problems among USAR/NG soldiers who had been deployed (Anderson Goodell et al., 2020). Our previous work demonstrated that negative NDE were associated with more severe depression symptomatology (Hoopsick et al., 2018a). Depression has also been shown to be associated with alcohol misuse among military populations (Calhoun et al., 2018; Fetzner et al., 2013). Therefore, to account for the potential confounding effects of depression, we assessed soldiers’ depression symptomatology using the PHQ-8 (Kroenke et al., 2009). This 8-item measure assesses the frequency with which respondents have experienced symptoms of depression over the last 2 weeks. Example items include “Feeling down, depressed, or hopeless” and “Feeling bad about yourself” ($\alpha = 0.91$).

Statistical Analyses

We performed all analyses using Stata version 15.1 software (Stata Corporation, College Station, TX). We used descriptive statistics to characterize the study sample. We separately examined the main effects of NDE on total AUDIT score and the domains of hazardous drinking (i.e., alcohol consumption, alcohol dependence, alcohol-related problems) using both unadjusted and adjusted negative binomial regression models. Final models controlled for years of military service, rank, number of military friends in the social network, and depression. Risk ratios (RR) and 95% confidence intervals (CI) are reported. To examine the potential effect modification of several resiliency factors (i.e., marital satisfaction, psychological hardiness, intrinsic religiosity), we added a cross-product term to the final model for each resiliency factor, separately. To further interpret and explain significant effect modification, predictive margins (Williams, 2012) were calculated at the 10th and 90th percentile scores of each resiliency factor to examine differences in total AUDIT score and the domains of hazardous drinking between those with the lowest and highest levels of resiliency, separately. Predictive margins were then displayed via figure for clarity when effect modification was statistically significant.

RESULTS

Descriptive Results

Among this sample of never-deployed male USAR/NG soldiers, NDE were prevalent (i.e., endorsement of NDE items with a response of (1) "A little bit," (2) "Moderately," (3) "Quite a bit," or (4) "Extremely"). The mean (standard deviation [\pm SD]) NDE score was 4.0 (\pm 4.2). Among the components of NDE (i.e., guilt, value, camaraderie, connectedness), 63.4% ($n = 71$) of the sample endorsed feelings of guilt for never having been deployed. Similarly, 54.5% ($n = 61$) reported feelings of decreased value to his unit, 48.2% ($n = 54$) reported decreased camaraderie with his unit, and 48.2% ($n = 54$) endorsed feelings of decreased connectedness with his unit for never having been deployed. The mean (\pm SD) AUDIT score was 4.0 (\pm 3.6). However, 11.6% of the sample had an AUDIT score greater than 8, which is indicative of a clinically significant problem with alcohol (Babor and Del Boca, 1992; Saunders et al., 1993).

Main Effects of NDE on Hazardous Drinking

More negative NDE were associated with greater total AUDIT score (RR = 1.07, 95% CI: 1.03, 1.11), greater alcohol consumption (RR = 1.05, 95% CI: 1.02, 1.07; Table 2), and greater alcohol dependence (RR = 1.17, 95% CI: 1.03, 1.32). After controlling for years of military service, rank, the number of military friends in the social network, and depression, the associations between NDE and total AUDIT score (adjusted risk ratio [aRR] = 1.05, 95% CI: 1.01, 1.10) and between NDE and alcohol consumption (aRR = 1.04, 95% CI: 1.01, 1.07) remained significant. The relation between NDE and alcohol dependence was no longer statistically significant after controlling for relevant confounders ($p > 0.05$). NDE were not significantly associated with alcohol-related problems in unadjusted or adjusted models ($ps > 0.05$).

Table 2. Effects of NDE on Total AUDIT and Subscale Scores Among Male Never-Deployed USAR/NG Soldiers

	Total AUDIT score		Alcohol consumption subscale score		Alcohol dependence subscale score		Alcohol-related problems subscale score	
	RR (95% CI)	aRR (95% CI)	RR (95% CI)	aRR (95% CI)	RR (95% CI)	aRR (95% CI)	RR (95% CI)	aRR (95% CI)
Nondeployment emotions	1.07*** (1.03, 1.11)	1.05* (1.01, 1.09)	1.05*** (1.02, 1.07)	1.04** (1.01, 1.07)	1.17* (1.03, 1.32)	1.24 (0.99, 1.56)	1.13 (0.97, 1.31)	1.07 (0.87, 1.31)
Years of military service		0.99 (0.95, 1.03)		0.99 (0.96, 1.02)		0.88 (0.71, 1.10)		1.02 (0.88, 1.18)
Rank ^a		1.45 (0.98, 2.15)		1.48** (1.12, 1.94)		0.64 (0.11, 3.87)		1.33 (0.27, 6.68)
Number of military friends in the social network		0.97 (0.84, 1.13)		1.05 (0.95, 1.17)		0.45 (0.19, 1.09)		0.54 (0.22, 1.36)
Depression		1.12 (0.90, 1.40)		1.02 (0.99, 1.05)		1.06 (0.87, 1.29)		1.04 (0.85, 1.26)

AUDIT, Alcohol Use Disorders Identification Test; aRR, adjusted risk ratio; CI, confidence interval; NDE, nondeployment emotions; RR, risk ratio; USAR/NG, United States Army Reserve/National Guard.

^aEnlisted rank is reference group.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Bolded values are statistically significant.

Effect Modification of Marital Satisfaction on NDE and Hazardous Drinking

Marital satisfaction demonstrated significant effect modification on the relation between NDE and total AUDIT score (aRR = 0.99, 95% CI: 0.99, 0.99; Table 3), such that greater NDE were associated with greater total AUDIT score only among soldiers reporting low marital satisfaction (Fig. 1). Likewise, marital satisfaction significantly modified the effect of NDE on alcohol dependence (aRR = 0.99, 95% CI: 0.98, 0.99; Fig. 2), with a greater likelihood of alcohol dependence with increasing NDE among soldiers with low marital satisfaction. There was no statistically significant effect modification of marital satisfaction on the relation between NDE and alcohol consumption or alcohol-related problems (*ps* > 0.05).

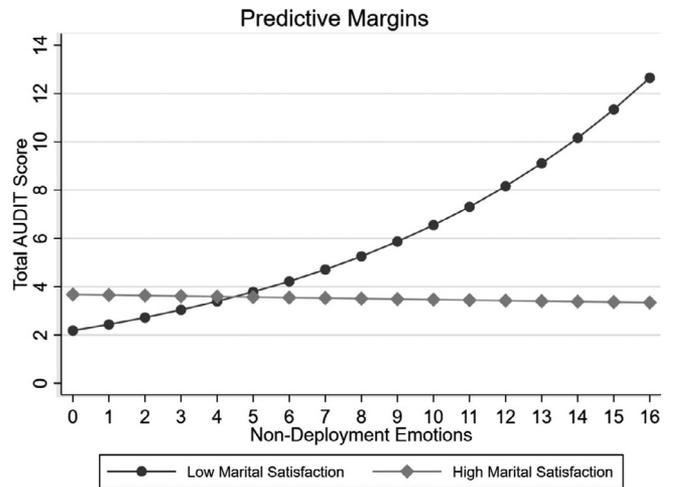


Fig. 1. Effect modification of marital satisfaction on NDE and total AUDIT score.

Effect Modification of Psychological Hardiness on NDE and Hazardous Drinking

Psychological hardiness significantly modified the effect of NDE on total AUDIT score (aRR = 0.99, 95% CI: 0.99, 0.99; Table 4). Soldiers who experienced high NDE in the presence of low psychological hardiness had the greatest total AUDIT score (Fig. 3). There was a similar effect of psychological hardiness on the relation between NDE and alcohol dependence (aRR = 0.95, 95% CI: 0.91, 0.98; Fig. 4). Psychological hardiness did not demonstrate any significant effect modification on the relation between NDE and alcohol consumption or alcohol-related problems (*ps* > 0.05).

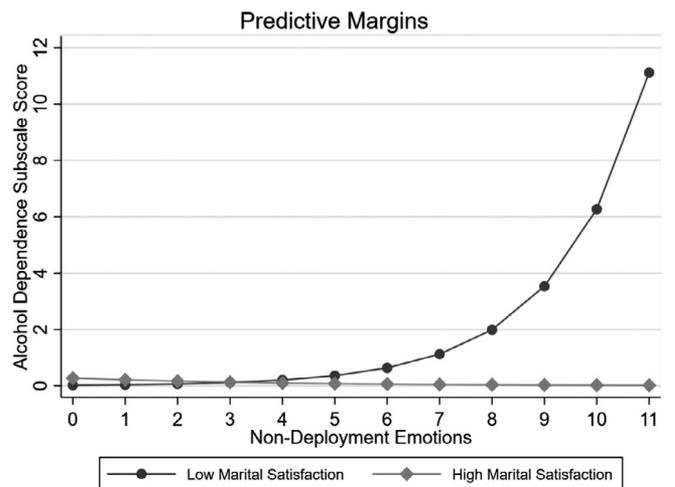


Fig. 2. Effect modification of marital satisfaction on NDE and alcohol dependence subscale score.

Effect Modification of Intrinsic Religiosity on NDE and Hazardous Drinking

Intrinsic religiosity showed significant effect modification on the relation between NDE and total AUDIT score (aRR = 0.99, 95% CI: 0.98, 0.99), such that soldiers who experienced high NDE in the presence of low intrinsic

Table 3. Effect Modification of Marital Satisfaction on NDE and Total AUDIT and Subscale Scores Among Male Never-deployed USAR/NG Soldiers

	Total AUDIT score aRR (95% CI)	Alcohol consumption subscale score aRR (95% CI)	Alcohol dependence subscale score aRR (95% CI)	Alcohol-related problems subscale score aRR (95% CI)
NDE × marital satisfaction	0.99* (0.99, 0.99)	0.99 (0.99, 1.00)	0.99* (0.98, .99)	0.99 (0.99, 1.00)
Nondeployment emotions	1.27** (1.07, 1.49)	1.15* (1.03, 1.29)	4.37* (1.41, 13.55)	1.43 (0.58, 3.51)
Marital satisfaction	1.01 (1.00, 1.02)	1.01* (1.01, 1.01)	1.04 (0.99, 1.09)	1.00 (0.95, 1.04)
Years of military service	0.99 (0.95, 1.02)	0.98 (0.96, 1.01)	0.88 (0.70, 1.10)	1.01 (0.88, 1.15)
Rank ^a	1.53* (1.05, 2.25)	1.52** (1.16, 2.01)	0.12 (0.00, 3.20)	1.33 (0.27, 6.49)
Number of military friends in the social network	0.98 (0.85, 1.14)	1.04 (0.94, 1.15)	0.35 (0.12, 1.05)	0.50 (0.20, 1.25)
Depression	1.02 (0.98, 1.06)	1.02 (0.99, 1.05)	0.99 (0.82, 1.21)	1.05 (0.86, 1.29)

AUDIT, Alcohol Use Disorders Identification Test; aRR, adjusted risk ratio; CI, confidence interval; NDE, nondeployment emotions; RR, risk ratio; USAR/NG, United States Army Reserve/National Guard.

^aEnlisted rank is reference group.

p* < 0.05; *p* < 0.01; ****p* < 0.001.

Bolded values are statistically significant.

Table 4. Effect Modification of Psychological Hardiness on NDE and Total AUDIT and Subscale Scores Among Male Never-deployed USAR/NG Soldiers

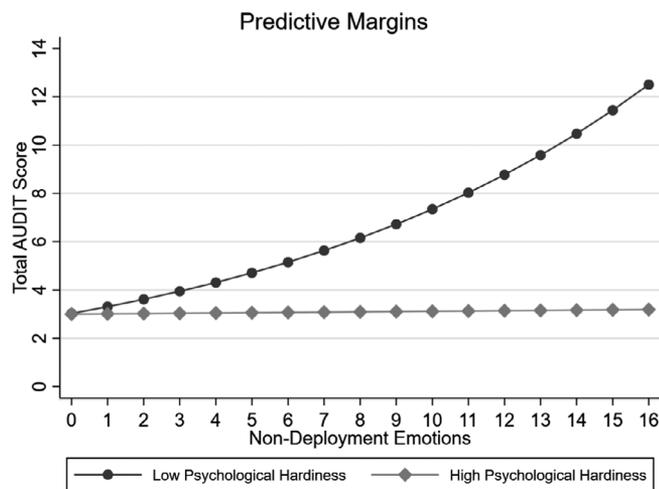
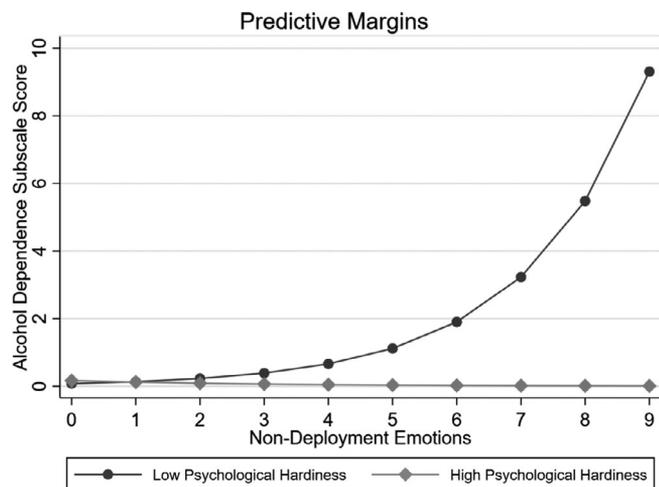
	Total AUDIT score aRR (95% CI)	Alcohol consumption subscale score aRR (95% CI)	Alcohol dependence subscale score aRR (95% CI)	Alcohol-related problems subscale score aRR (95% CI)
NDE × psychological hardiness	0.99* (0.99, 0.99)	1.00 (0.99, 1.00)	0.95** (0.91, 0.98)	0.99 (0.97, 1.01)
Nondeployment emotions	1.25* (1.06, 1.48)	1.12 (0.99, 1.26)	6.56** (1.85, 23.26)	1.54 (0.81, 2.90)
Psychological hardiness	0.99 (0.97, 1.03)	1.01 (0.98, 1.04)	1.05 (0.90, 1.22)	0.97 (0.86, 1.09)
Years of military service	0.98 (0.95, 1.02)	0.99 (0.96, 1.01)	0.81 (0.64, 1.02)	0.99 (0.86, 1.14)
Rank ^a	1.60* (1.10, 2.35)	1.51** (1.15, 1.99)	0.62 (0.11, 3.63)	1.92 (0.40, 9.29)
Number of military friends in the social network	0.96 (0.83, 1.11)	1.04 (0.94, 1.16)	0.25* (0.08, 0.73)	0.51 (0.22, 1.23)
Depression	1.00 (0.96, 1.04)	1.01 (0.98, 1.04)	0.80 (0.61, 1.05)	1.00 (0.83, 1.22)

ARR, adjusted risk ratio; AUDIT, Alcohol Use Disorders Identification Test; CI, confidence interval; NDE, nondeployment emotions; RR, risk ratio; USAR/NG, United States Army Reserve/National Guard.

^aEnlisted rank is reference group.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Bolded values are statistically significant.

**Fig. 3.** Effect modification of psychological hardiness on NDE and total AUDIT score.**Fig. 4.** Effect modification of psychological hardiness on NDE and alcohol dependence subscale score.

religiosity had the greatest total AUDIT score (Table 5; Fig. 5). However, there was no effect modification by intrinsic religiosity on the relations between NDE and any of the specific domains of hazardous drinking ($ps > 0.05$).

DISCUSSION

There are over 1 million Reservists enlisted in the US Armed Forces, the greatest proportion of whom are male USAR/NG soldiers (Office of the Deputy Assistant Secretary of Defense, 2016). Moreover, a federal advisory committee to the US Department of Defense has identified as a strategic goal to grow the size and capacity of Reserve Components (Reserve Forces Policy Board, 2017). Some of these soldiers may never deploy during their military careers (Defense Manpower Data Center, 2017). While most research has focused on the effects of deployment and combat, emerging literature suggests that alcohol use behaviors and the likelihood of alcohol problems do not significantly differ between service members who have and have not experienced deployment (Hoopsick et al., 2019; Trautmann et al., 2014). Thus, findings from this research are important because they illuminate several factors that may contribute to enhanced resiliency among never-deployed male USAR/NG soldiers who represent a highly understudied, but at-risk and growing population.

Expanding on our previous research that examined the relation between NDE and total AUDIT score among male and female soldiers (Hoopsick et al., 2018b), the current study demonstrates that greater NDE are also associated with the alcohol consumption and dependence domains of hazardous drinking, in addition to total AUDIT score, among never-deployed male soldiers. Although NDE were not significantly associated with the alcohol-related problems subscale of the AUDIT in this sample, the magnitude and direction of the estimate of association was consistent with our other findings, suggestive of a possible relationship that we were not powered to detect with this sample size.

Table 5. Effect Modification of Intrinsic Religiosity on NDE and Total AUDIT and Subscale Scores Among Male Never-Deployed USAR/NG Soldiers

	Total AUDIT score aRR (95% CI)	Alcohol consumption subscale score aRR (95% CI)	Alcohol dependence subscale score aRR (95% CI)	Alcohol-related problems subscale score aRR (95% CI)
NDE × intrinsic religiosity	0.99* (0.98, 0.99)	0.99 (0.99, 1.00)	0.95 (0.88, 1.03)	0.97 (0.92, 1.02)
NDE	1.11** (1.03, 1.20)	1.07** (1.02, 1.13)	1.65 (0.95, 2.84)	1.30 (0.86, 1.95)
Intrinsic religiosity	1.01 (0.96, 1.06)	0.99 (0.95, 1.03)	1.01 (0.78, 1.32)	1.08 (0.85, 1.37)
Years of military service	0.99 (0.95, 1.02)	0.99 (0.96, 1.02)	0.85 (0.67, 1.07)	0.99 (0.85, 1.15)
Rank ^a	1.48* (1.02, 2.16)	1.50** (1.14, 1.96)	0.65 (0.10, 4.27)	1.54 (0.31, 7.62)
Number of military friends in the social network	0.96 (0.83, 1.11)	1.05 (0.94, 1.16)	0.37 (0.14, 1.02)	0.51 (0.20, 1.29)
Depression	1.02 (0.98, 1.06)	1.02 (0.99, 1.04)	1.03 (0.84, 1.25)	1.03 (0.85, 1.25)

ARR, adjusted risk ratio; AUDIT, Alcohol Use Disorders Identification Test; CI, confidence interval; NDE, nondeployment emotions; RR, risk ratio; USAR/NG, United States Army Reserve/National Guard.

^aEnlisted rank is reference group.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Bolded values are statistically significant.

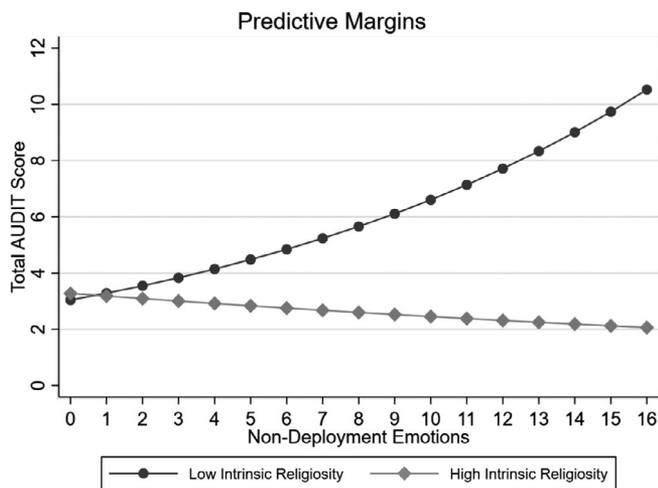


Fig. 5. Effect modification of intrinsic religiosity on NDE and AUDIT score.

The current study further extends the emerging body of literature regarding never-deployed service members by showing that there are also several inter- and intrapersonal factors that buffer the effects of NDE on hazardous drinking, particularly symptoms of alcohol dependence. While prior research has demonstrated that marital satisfaction, psychological hardiness, and spirituality/religiosity are protective against problem drinking in military populations in the context of deployment (Bartone et al., 2012, 2015; Ganocy et al., 2016; Sharma et al., 2017; Vest et al., 2018), the current study suggests that these inter- and intrapersonal factors promote resiliency among never-deployed USAR/NG soldiers as well. Further, these factors appear to buffer the effects of NDE on hazardous drinking among never-deployed USAR/NG soldiers who are male—a subgroup with a disproportional risk for hazardous drinking (Hoopsick et al., 2018b). This is an important consideration as 1 study showed that never-deployed service members are approximately 2 times *less* likely to seek care for psychological symptomatology than service members who had recently been deployed, and also report

perceived barriers and stigmas associated with seeking treatment (Chapman et al., 2014).

NDE are important to consider in the context of the Reserve identity (Griffith, 2011), of which deployment and group membership are central components. The current findings show that many never-deployed male USAR/NG soldiers experience feelings of guilt, decreased value to their unit, decreased camaraderie with their unit, and decreased connectedness with their unit for never having been deployed. It is possible that these soldiers experience additional psychological sequelae as a result of struggling with their identity as soldiers and belonging (Hoopsick et al., 2018a, 2018b). Never-deployed USAR/NG soldiers may be particularly vulnerable to the effects of NDE given the limited time they spend with their units. Although those who are deployed may spend upwards of a year or more together with their unit (Adler et al., 2005), USAR/NG soldiers who do not deploy typically only perform 39 days of military service annually and participate in monthly weekend drills and several days of training (Griffith, 2010). Coupled with these identity challenges, limited support provided by fellow unit members may manifest in an increased risk of hazardous drinking among never-deployed male USAR/NG soldiers.

Interestingly, military rank was consistently a significant covariate in our models, with officers having a *greater* likelihood of hazardous drinking than enlisted soldiers. This is in contrast to research in other military populations that have shown a greater risk of alcohol misuse among lower ranking service members (Head et al., 2016; Ijomanta and Lasebikan, 2016; Trautmann et al., 2015). However, these previous studies included service members who had been deployed. It is possible that service members in higher ranks who have never been deployed are *more* susceptible to identity struggles and the effects of NDE on alcohol misuse than lower ranking individuals. Specifically, they may experience challenges with perceived legitimacy in their leadership role if they have not experienced deployment, especially if they are in a leadership position with previously deployed enlisted

soldiers, thereby magnifying the impact of NDE. Additional research is needed to examine this phenomenon.

Limitations

Our findings should be interpreted within the context of the limitations of this study. First, we used a subset of cross-sectional data. Therefore, the temporality between NDE, hazardous drinking, and resiliency cannot be established here. As such, it is also possible that the observed relations between NDE and hazardous drinking may be explained by another factor that affects both NDE and drinking behavior, but was not examined in the current study. However, given the longitudinal design of the larger Operation: SAFETY study, there will be future opportunities to examine the nuances of these relations over time, which may yield more contextual information. Second, all survey-based research has the potential for response bias, but the use of confidential computer-assisted interviewing methods has been shown to result in valid assessments of substance use (McNeely et al., 2016; Wolff and Shi, 2015). Further, computerized screenings for hazardous drinking have been shown to outperform traditional face-to-face methods (Imani et al., 2017). Third, being married or living as if married was an eligibility criterion for Operation: SAFETY, which may limit generalizability. However, national data indicate that most US service members are married (Office of the Deputy Assistant Secretary of Defense, 2016), lending confidence in the generalizability of the present findings. Lastly, it is possible that the “healthy warrior effect” (Wilson et al., 2009) may partially explain hazardous drinking among this sample of never-deployed service members, whereby service members with greater psychological symptomatology are less likely to be selected for deployment.

Strengths

The current research also has several notable strengths. Our findings extend previous research that demonstrated a relation between NDE and alcohol misuse (Hoopsick et al., 2018b) by showing that several resiliency factors appear to be protective against the effects of NDE. This is important because many USAR/NG soldiers may never deploy during their military careers (Defense Manpower Data Center, 2017), but remain at significant risk for poor behavioral health, including alcohol misuse (Hoopsick et al., 2018a, 2018b, 2019; Trautmann et al., 2014). Further, this at-risk population is expected to continue to grow (Reserve Forces Policy Board, 2017). While other research has shown that resilience is important to consider in the context of deployment-related sequelae, the current study is novel in that it examines the role of resilience among service members who have never been deployed. These findings contribute to a greater understanding of never-deployed USAR/NG soldiers—a high risk, but significantly understudied population.

CONCLUSION AND FUTURE DIRECTIONS

Findings from the current study demonstrate that while negative emotions related to never having been deployed are associated with hazardous drinking, there are several inter- and intrapersonal resiliency factors that buffer this effect among never-deployed male USAR/NG soldiers. Marital satisfaction, psychological hardiness, and intrinsic religiosity all represent potential targets for military interventions aimed at enhancing resiliency. Further, it is also possible that interventions tailored to never-deployed soldiers may be able to affect NDE *directly* via normalization of nondeployment and education on adaptive coping strategies. Although there are existing predeployment and postdeployment interventions that were developed to increase resiliency in the context of deployment experiences, we recommend an additional focus on interventions that facilitate enhanced resiliency, regardless of anticipated or experienced deployment. Interventions specifically tailored to never-deployed soldiers should also be considered. Programming to enhance resilience and support and to promote family relationships should be incorporated routinely and regularly throughout military participation for all soldiers.

Additional research is needed to examine the role of inter- and intrapersonal resiliency factors among never-deployed service members in larger samples, in other military branches, and among unpartnered service members. Future work should also examine the unique social network characteristics of never-deployed service members and the impacts of these social supports on alcohol and other substance use in this understudied population. We also recommend that additional research should examine the effects of NDE among never-deployed service members who are not married/living as if married, given that unpartnered service members are likely to have different types of social supports than the soldiers included in the current study. Further research is also needed to examine the composition and behaviors of the social networks of never-deployed soldiers, beyond just the number of network members, and their relation to alcohol and other substance use. It is also important for additional research on never-deployed service members to further examine the contexts in which they are not selected for deployment, as these contexts might have varying roles in the development of NDE: USAR/NG soldiers might not be selected for deployment due to their specific military job function, individual physical or mental health conditions, or entire units may not be selected for deployment. While individual health status might lend itself to feelings of shame or stigma, when entire units are not selected for deployment or soldiers are not selected for deployment based on their military job function, it is not that “healthy warriors” (Wilson et al., 2009) are the only soldiers to be deployed.

Special consideration should be given to never-deployed service members who may be less likely to seek and receive support for emotional, mental, and substance use problems.

They may therefore be less likely to receive resilience-building interventions than their previously deployed counterparts, indicating a broad universal approach may be more effective. In addition to existing deployment preparation interventions and reintegration efforts, it would be beneficial if all soldiers received resiliency training as a component of Advanced Individual Training (following Basic Combat Training), the time when USAR/NG soldiers gain expertise in a specific military job function. If resilience building was integrated as a component of this routine training, rather than as an adjunctive intervention only received by some soldiers, all soldiers might be better protected from hazardous drinking and other psychosocial problems. Further, introducing adaptive coping strategies at this time might improve the salience of resilience to the Reserve identity (Griffith, 2011) within the context of each soldier's unique military role. Additional ongoing resilience-based interventions are recommended for all service members, regardless of deployment.

FUNDING DISCLOSURE

Research reported in this manuscript was supported by the National Institute on Drug Abuse award number R01DA034072 to Gregory G. Homish and by the National Center for Advancing Translational Sciences of the National Institutes of Health under award number UL1TR001412 to the University at Buffalo. This research was also supported by the Health Resources and Services Administration award number T32HP30035 in support of Rachel A. Hoopsick (PI: Linda S. Kahn). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

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