Associations between Deployment, Military Rank, and Binge Drinking in Active Duty and Reserve/National Guard US Servicewomen

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ABSTRACT

Background: Prior studies of mostly male U.S. service members suggest service characteristics such as deployment with combat exposure and lower rank may be a risk factor for alcohol misuse. However, these relationships have not been examined among servicewomen who may be at high risk for experiencing deployment-related stressors and associated health consequences. This cross-sectional report of US servicewomen in the Reserve National Guard (RNG) and active component (AC) sought to examine these associations. **Methods:** A Midwestern community sample of currently serving and veteran servicewomen (N = 1,339) completed structured telephone interviews. The Generalized Linear Model was used to examine associations between service characteristics, any binge drinking, and frequency of recent binge drinking after adjusting for demographics. **Results:** After adjusting for demographics, deployment to Iraq or Afghanistan was associated with greater odds of reporting a binge drinking episode, compared to no deployment, among servicewomen in the AC but not RNG. Deployment to Iraq or Afghanistan was also associated with more days binge drinking in both groups compared to servicewomen not deployed. Lower ranking servicewomen also reported higher odds of a binge drinking episode and higher frequency of binge drinking in both the RNG and AC. **Conclusions:** Service characteristics including deployment to Iraq or Afghanistan (vs. those not deployed) and lower rank (vs. officers) may be a risk factor for recent binge drinking and higher frequency of binge drinking among servicewomen, after adjusting for demographic covariates. Public health and clinical implications are discussed.

KEYWORDS: U.S. servicewomen, binge drinking, deployment, military rank

1. INTRODUCTION

Rates of binge drinking among U.S. military personnel are high and associated with numerous negative health and social outcomes (Jacobson et al., 2008; Stahre et al., 2009). A recent study of U.S. servicewomen found that 8% of active duty women (or full-time military personnel, henceforth referred to as active component or AC) and 9% of women surveyed in the Reserve or National Guard (RNG) reported heavy drinking (consuming greater than 7 drinks in the past week) (Jacobson et al., 2008). Jacobson et al. (2008) also found that 7% of RNG and 9% of AC servicewomen surveyed reported at least one alcohol-related problem such as missed work or school and/or driving a vehicle while intoxicated in the past year, respectively.

Research suggests that servicewomen are also at high risk for developing new onset heavy weekly drinking following military service (Jacobson et al., 2008) and women in general may experience a disproportionate frequency and scope of alcohol-related problems when compared to men (Sanchez-Craig et al., 1995), even at lower levels of alcohol consumption (NIAAA, 2010). These findings point to service involvement as a potential contributor to alcohol misuse among women and suggest that women experience greater health consequences as a result of harmful drinking patterns. Unfortunately, little is known about characteristics of service involvement that may be associated with alcohol misuse among servicewomen, especially amongst those who may have been deployed overseas.

Prior studies of mostly male samples have shown deployment with combat exposure to be a strong correlate of alcohol misuse among the larger population of male U.S. service members. A recent study found that being deployed and experiencing combat-related stressors was associated with a greater likelihood (compared to no deployment) of binge drinking post-deployment among AC service members (Jacobson et al., 2008: 73% male). In the same study,

service in the RNG while deployed was associated with a greater likelihood of engaging in new onset heavy weekly drinking, binge drinking, and experiencing alcohol-related problems post-deployment when compared to their deployed AC peers but gender differences were not reported (Jacobson et al., 2008). Elsewhere, a sample of mostly male RNG service members also reported a greater likelihood of alcohol misuse or aggression (e.g., hitting someone) co-occurring with depression or posttraumatic stress disorder (PTSD) 1-year post-deployment than men in the AC (Thomas et al., 2010: 99% male). Unfortunately, no studies have examined deployment in relation to alcohol misuse among U.S. servicewomen, and especially among servicewomen in the RNG who may be less prepared to cope with deployment-related stressors (Vogt et al., 2008). For example, servicewomen deployed overseas are at high risk for experiencing sexual harassment and sexual assault (LeardMann et al., 2013) which may contribute to alcohol misuse (Booth et al., 2011).

Lower military rank has also been shown to be associated with greater alcohol misU.S.e among U.S. military personnel (Mattiko et al., 2011; Stahre et al., 2009). Mattiko and colleagues (2011) found, among a mostly male sample, that enlisted and non-commissioned officers (NCOs) in the AC were two to three times more likely than senior officers to engage in heavy drinking (≥ 5 drinks per typical drinking occasion at least once a week) in the past 30 days after controlling for age, race/ethnicity, and marital status. Stahre and colleagues (2009) found, among a subsample of AC servicewomen consuming alcohol in the past 30 days, that enlisted (47.8%), NCOs (36.1%), and warrant officers (37.3%) reported higher rates of 30-day binge drinking when compared to senior officers (18.2%) (Stahre et al., 2009). These studies are limited in terms of focusing mostly on men (i.e., Mattiko et al., 2011) or on subsamples of AC servicewomen reporting recent alcohol use (Stahre et al., 2009) and not on a more representative

community sample of servicewomen. Therefore, there is a need to extend these findings to a community sample of servicewomen in the AC and RNG given that lower rank may put some servicewomen at greater risk of experiencing gender harassment, unwanted sexual attention, sexual coercion (Buchanan et al., 2008), and perhaps associated emotional distress which may contribute to alcohol misuse (Booth et al., 2011).

This cross-sectional report from a large sample ($N = 1339$) of U.S. Operations Iraqi Freedom or Operations Enduring Freedom (OIF/OEF) servicewomen attempts to address this gap in the literature by examining associations between military deployment (none, deployed to Iraq or Afghanistan [I/A], and deployed elsewhere) and military rank (junior enlisted, NCO, or officer) with any binge drinking and frequency of binge drinking in the past four weeks. We examined these relationships separately for women in the RNG and AC in light of prior research showing that RNG service members may be more vulnerable to the negative effects of deployment when compared to their AC peers (Thomas et al., 2010; Vogt et al., 2008). We hypothesized that (a) deployment to I/A and (b) lower military rank would be associated with greater likelihood of any binge drinking and days binge drinking in the past four weeks among servicewomen in both the RNG and AC.

2. METHODS

2.1. Participants and Procedure

Participants included women drawn from two mutually exclusive populations of RNG ($N = 665$) and AC ($N = 674$). At the time of study participation, some servicewomen were still serving ($N = 1056$), while others had separated from service ($N = 283$). There was no difference in binge drinking between separated and still serving women (8.7% vs. 6.4%, $p=0.20$). All participants had served or were currently serving in the Army or Air Force, and resided, served

or had enlisted from a Midwestern state (Iowa, Illinois, Missouri, Nebraska, and Kansas). Our sampling strategy involved stratifying by deployment history (never deployed, deployed to I/A, or deployed elsewhere) and oversampling for officers. The Defense Manpower Data Center (DMDC) provided contact information and select military characteristics (e.g., rank, deployment) for all participants.

Recruitment involved first mailing invitation packets (i.e., letter describing this study, consent form, and brochure describing VA research in general) followed by telephone calls from study staff to potential participants. Women were reimbursed \$50 for participation and received an additional \$10 call-in incentive if they contacted the study team to participate after receiving the mailed invitation. Exclusion criteria included having a disability that might interfere with the quality of a telephone interview including problems hearing or with comprehension and/or a dishonorable discharge. Both studies were granted a waiver of signed consent by the authors' Institutional Review Board thus signed consent forms were not required.

Total response rate to the study was 57%. Response rate for the RNG sample was 70%, while the response rate for participants recruited from the AC sample was 47% (see Mengeling et al., 2014 for more details on participation rates). Comparisons on demographic characteristics between study non-responders and responders showed that the latter group was younger in age and less likely to have completed college. Study responders tended to be older in age, more likely to be Caucasian, and graduate from college. Common reasons for refusing to participate included being too busy (33%) and not interested in participating in the study (46%) (Mengeling et al., 2014).

A Computer-Assisted Telephone Interview was used to query participants' demographic and military characteristics, and occurrence and frequency of binge drinking in the past four

weeks. This interview included other potentially relevant measures for drinking behavior such as history of sexual assault, including while in the military, deployment experiences, and current depression and post-traumatic stress disorder. These measures are clearly important to evaluate with respect to current drinking behavior and will be examined in future reports.

RNG and AC interviews were conducted from March 2010 to September 2010 and from October 2010 to December 2011, respectively. The average interview lasted for 1.5 hours and most participants (73%) completed the interview in a single phone call.

2.2. Measures

2.2.1. Independent variables

2.2.1.1 Military characteristics. Deployment history and military rank were the independent variables of interest in this study. Military rank was provided by the DMDC and grouped into three categories including junior enlisted personnel (pay grades = E1 to E4), noncommissioned officers (NCO) (paygrades = E5 to E9), and officers (paygrades = O1 to O6 and W01 to W04).

2.2.1.2 Demographic characteristics. Demographic covariates were included in our statistical models based on review of the prior literature documenting characteristics of U.S. military personnel that are associated with alcohol misuse (Mattiko et al., 2011; Stahre et al., 2009). Thus, participants' age, marital status, and race/ethnicity are described and were included as covariates in our adjusted statistical models.

2.2.2 Dependent variables

2.2.2.1 Binge drinking. Data on the occurrence (yes/no) and frequency (number of days) of binge drinking in the past four weeks were collected during the interview. Binge drinking episodes were identified with the following question, "During the past 4 weeks, on the days that you drank, how many days have you had 4 drinks or more in the same day?" This question was

drawn from the Substance Abuse Outcomes Module which is a well-validated and reliable self-report instrument designed to assess diagnostic criteria for substance use disorders (Smith et al., 2006). The average number of binge drinking days was calculated in the past four weeks for all participants.

2.3 *Data Analysis*

All statistical analyses were conducted using SAS/STAT version 9.3. Descriptive statistics were calculated and presented for all variables. To test our main hypothesis, bivariate associations between independent variables (deployment and military rank), covariates (demographic characteristics) and dependent variables (occurrence and frequency of binge drinking) were examined using generalized linear models (GLM). Logistic regression was used to examine bivariate associations between the independent variables, covariates and binge drinking as a dichotomous outcome (yes/no), while bivariate associations between independent variables, covariates and days of drinking were examined using log-linear model with a negative binomial distribution with log link. The same approaches were used to examine the multivariate association between independent variables and dependent variables after controlling for demographic covariates (age, marital status, and race/ethnicity). Predicted mean probabilities of binge drinking from multivariate logistic regression models and predicted mean binge drinking days from log-linear models for the independent variables of interest (i.e., deployment category and rank) were also calculated with the continuous covariates set at their mean values and categorical covariates set at one divided by number of the groups. Two-sided hypothesis testing was performed for all analyses with significance level of .05.

3. **RESULTS**

Table 1 presents descriptive statistics for demographics and military characteristics for the total sample, and RNG and AC separately. Study participants tended to be relatively young (Mean age = 34.8, SD = 9.7), married (56%), and white (73%). Most participants were NCOs (52%) and had been deployed to I/A (52%). RNG servicewomen were older in age (Mean = 37.6 years, SD = 10.4) than AC servicewomen (Mean = 32.0 years, SD = 7.9), had a greater percentage of deployment elsewhere, and a smaller percentage were never deployed. Also, a higher percentage of AC servicewoman were black (21%) when compared to RNG (16%).

Eight percent of the total sample reported a binge drinking episode in the past four weeks, with a mean average of 0.45 drinking days (SD = 2.30) (see Table 1). No statistically significant differences were observed between RNG and AC on rates of any binge drinking or days binge drinking in the past four weeks.

3.1. Deployment status and military rank (bivariate analyses)

3.1.1 Any binge drinking. Moderate-size associations were observed between deployment to I/A as compared to no deployment and any binge drinking in both the RNG (Odds Ratio [OR] = 2.71, 95% Confidence Interval [CI] = 1.19, 6.19) and AC (OR = 2.26, CI = 1.10, 4.66) (Table 2). Stronger associations were observed between military rank and any binge drinking. Compared to officers, junior enlisted and NCO rank servicewomen had greater odds of a binge drinking episode in both the RNG (OR = 4.85, CI = 1.79, 13.18; OR = 3.86, CI = 1.60, 9.30) and AC (OR = 4.50, CI = 1.62, 12.50; OR = 3.83, CI = 1.46, 10.02), respectively.

3.1.2 Frequency of binge drinking. Servicewomen deployed to I/A reported greater binge drinking frequency in the RNG (predicted mean ratio = 5.84, CI = 1.85, 18.41) and AC (predicted mean ratio = 3.31, CI = 1.24, 8.83) when compared to servicewomen not deployed (Table 3). Associations between deployment elsewhere compared to no deployment and military

rank with the frequency (days) of binge drinking were not statistically significant for either sample.

3.2. *Deployment status and military rank (multivariate analyses)*

3.2.1 *Any binge drinking.* After controlling for demographic covariates and with rank included in the models, moderate-size associations between deployment to I/A (compared to no deployment) and any binge drinking were again observed in both the RNG (OR = 2.12, CI = 0.89, 5.02) and AC (OR = 2.49, CI = 1.15, 5.42) (Table 4). Servicewomen in the AC who had deployed to I/A had a greater predicted probability of binge drinking in the past four weeks compared to never deployed servicewomen (5% vs. 2%, $p < 0.05$).

The moderate- to large-size associations observed in the bivariate analysis for rank were again observed after controlling for demographics, especially in the AC sample. Both lower rank groups (junior enlisted and NCO) compared to officers had greater odds of binge drinking in the AC (OR = 3.92, CI = 1.22, 12.54 and OR = 3.73, CI = 1.38, 10.11, respectively). Further, in the RNG, servicewomen of NCO rank had greater odds of binge drinking when compared to officers (OR = 2.58, CI = 1.03, 6.46). Correspondingly, the predicted probability of binge drinking for servicewomen in NCO rank was greater when compared to officers (6% vs. 2%). In the AC, junior enlisted (5%) and NCO (5%) servicewomen had a greater predicted probability of binge drinking when compared to officers (1%).

3.2.2 *Frequency of binge drinking.* The effect of deployment to I/A compared to no deployment as seen in the bivariate analysis was also observed after controlling for demographic covariates and with rank included in the multivariate model. Compared to no deployment, servicewomen deployed to I/A reported a greater number of days binge drinking in the past four weeks in both the RNG (predicted mean ratio = 5.06, CI = 1.49, 17.20) and AC (predicted mean ratio = 3.45, CI = 1.28, 9.29). The predicted days binge drinking were 0.65 and 0.13 respectively ($p < .05$) for

servicewomen in the RNG deployed to I/A and those not deployed but there was no statistically significant difference in predicted days between women deployed elsewhere and either those never deployed or those deployed to I/A in this group. Similarly, predicted mean days of binge drinking for AC differed between those deployed to I/A and never deployed (0.23 vs. 0.07 days, $p < 0.05$). For rank, NCO rank was also associated with a greater frequency of binge drinking in both the RNG (predicted mean ratio = 4.74, CI = 1.41, 15.90) and AC (predicted mean ratio = 3.26, CI = 1.003, 10.61) (see Table 5). In both samples, predicted mean drinking days for RNG NCO servicewomen were 0.45 more days compared to officers (0.57 vs. 0.12 days, $p < .05$), while predicted mean days for AC NCO servicewomen were 0.14 more days binge drinking (0.20 vs. 0.06 days, $p < .05$).

4. DISCUSSION

This study sought to examine whether deployment and military rank are associated with binge drinking in two samples of U.S. servicewomen – women in the RNG and AC. Our findings provide partial support for our hypotheses that deployment to I/A and lower rank are associated with greater odds of binge drinking and frequency of binge drinking in both AC and RNG servicewomen.

Bivariate analyses indicated that deployment to I/A (compared to no deployment) was associated with a two to two and a half times greater odds of any binge drinking in both AC and RNG. After adjusting for demographic covariates and with military rank in the model, this association remained statistically significant for AC but not RNG. This latter finding may be partially explained by the confounding effect of rank when included in the model for RNG. Without rank in the model, this association was statistically significant (OR = 2.41, CI = 1.03, 5.60, data not shown). This finding might be partially explained by greater representation of

lower ranking (57% in both junior enlisted and NCO) and lower representation of higher ranking (41% officers) servicewomen among those deployed to I/A in the RNG. Thus, including rank in the model may have weakened the effect of deployment to I/A on odds of any binge drinking in the RNG.

That said, our finding that deployment status among servicewomen is strongly associated with a recent occurrence of binge drinking in our sample is consistent with prior studies documenting an association between deployment with combat exposure and elevated rates of harmful drinking, including binge drinking (Jacobson et al., 2008; Thomas et al., 2010; Wilk et al., 2010) in mostly male samples of service members. For example, Jacobson et al. (2008) found higher odds of new-onset (past-year) post-deployment binge drinking (defined as consuming 5 or more drinks for men or 4 or more drinks for women on one day of the week, or 5 or more drinks on at least one day in the past year) among a mostly male sample of RNG and AC service members reporting combat exposure while deployed, compared to those with no deployment. High rates of post-deployment comorbid alcohol misuse (i.e., indicating “yes” to questions assessing “drinking more than intended and/or wanting or needing to stop drinking”) has also been found among a mostly male sample of OIF/OEF service members screening positive for depression or post-traumatic stress disorder (99% male; Thomas et al., 2008).

The bivariate and multivariate findings from the current study extend these findings to show that servicewomen deployed to I/A in the RNG and AC, particularly those in the AC, may also be at higher risk for recent binge drinking and increased frequency of recent binge drinking when compared to their non-deployed peers. Deployment to combat operations in these regions may put women at risk for experiencing combat-related stressors (Street et al., 2009) and interpersonal stressors including sexual assault and harassment (Maguen et al., 2012) which may

help explain the observed relationship between I/A deployment and binge drinking among servicewomen in our sample. For example, Wilk and colleagues (2010) found that exposure to combat experiences including death, injury, and atrocities were predictive of post-deployment alcohol misuse among a mostly male (96%) sample of U.S. soldiers. Symptoms of post-traumatic stress disorder (i.e., reexperiencing traumatic events) have also been shown to be predictive of post-deployment heavy drinking (consuming 5 or more drinks on one occasion) in a mostly male (92%) sample OIF/OEF veterans (Capone et al., 2013). Gradus and colleagues (2008) found military sexual harassment to be associated with harmful drinking (a score of 8 or greater on the Alcohol Use Disorders Identification Test) in a large sample of RNG servicewomen, but not men. Further studies are needed to identify deployment-related experiences and indicators of deployment-related stress and examine their role as potential risk factors for recent binge drinking among servicewomen deployed to I/A.

Our multivariate model showed, that compared to officers, lower ranking servicewomen had two to four times the odds of a binge drinking episode, and greater frequency (days) of binge drinking in the past four weeks. Prior research has found that lower ranking service members and specifically junior enlisted service members to have the highest rates of recent binge drinking amongst a mostly male sample participating in the Department of Defense Survey of Health Related Behaviors among Military Personnel (Stahre et al., 2009). The findings from this study, together with those of the larger literature (e.g., Mattiko et al., 2011; Stahre et al., 2009), suggest that lower rank may be a risk factor for any recent binge drinking and increased frequency of binge drinking among both male and female U.S. service members in both the RNG and AC. Indeed, a study of mostly male active duty service members found that being of junior enlisted or NCO rank was associated with a two to three times greater odds of heavy alcohol use (5 or more

drinks on a typical drinking occasion at least once a week) in the past 30 days compared to officers, after controlling for service type and demographics including gender (Mattiko et al., 2011). Our findings extend this research to show that lower rank (especially NCOs) among U.S. servicewomen is associated with greater odds of binge drinking and frequency of binge drinking in the past four weeks, after adjusting for age, race/ethnicity, and marital status. It is important to note that Stahre and colleagues (2009) found that in addition to junior enlisted and NCOs, active duty servicewomen reporting recent alcohol use and the rank of warrant officer had the second highest prevalence rates of past 30-day and per capita episodes of binge drinking (consuming ≥ 4 or more drinks on a single occasion). These findings suggest that, in addition to lower enlisted and NCOs, servicewomen with recent alcohol use and who are lower ranking officers may also be at high risk for recent binge drinking. Future studies that examine rank in relation to drinking outcomes among servicewomen should also distinguish between officer rank when examining this relationship.

In general, being of lower rank appears to put servicewomen at high risk for binge drinking and greater frequency of recent binge drinking. This finding is consistent with research showing that lower ranking service women report experiencing more overall sexual harassment than officers, and specifically gender harassment, crude behavior, unwanted sexual attention, and sexual coercion (Buchanan et al., 2008; Sadler et al., 2003). Enlisted servicewomen also report more psychological distress associated with sexual harassment than officers (Buchanan et al., 2008) lending some support to the notion that lower ranking servicewomen may drink to cope with negative emotions associated with such military experiences.

This study has several important limitations and strengths. First, the sample examined in this study was drawn from a regional versus a national sample of servicewomen which may limit

the generalizability of findings to servicewomen from other regions of the U.S.. Second, the response rate of the survey may suggest a response bias in that responders to the study survey tended to be of older age, Caucasian, and a college graduate. This potential response bias may have affected the internal validity of the study which would limit conclusions that can be drawn about relationships observed between military characteristics and binge drinking in this sample. Third, specific experiences during deployment and mental health characteristics of servicewomen that may partially account for the observed relationship between deployment to I/A and binge drinking were not examined and should be studied to better understand the potential effect of this experience on drinking behavior. Strengths of this study include a large sample of servicewomen drawn from two mutually exclusive military populations (RNG and AC) and sampling that was stratified by deployment history.

In conclusion, our results suggest that deployment to I/A and lower rank may be a risk factor for recent binge drinking and frequency of binge drinking among U.S. servicewomen. Future studies are needed to identify and examine relationships between deployment-related stressors and mental health characteristics of U.S. servicewomen deployed to I/A and/or of lower rank to better understand the observed associations with odds and frequency of recent binge drinking.

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Table 1. Demographic, military, and binge drinking characteristics for the total sample, RNG, and AC.

		Total (n=1339) n (%)	RNG (n = 665) n (%)	AC (n=674) n (%)	p value
Independent variables					
Deployment	None	348 (26)	144 (22)	204 (30)	0.0001
	Elsewhere	301 (22)	176 (26)	125 (19)	
	Iraq/Afghanistan	690 (52)	345 (52)	345 (51)	
Rank	Enlisted	257 (19)	101 (15)	156 (23)	0.0011
	NCO	690 (52)	361 (54)	329 (49)	
	Officer	392 (29)	203 (31)	189 (28)	
Age (mean/sd)		34.79 (9.65)	37.63 (10.40)	32.00 (7.92)	<.0001
Marital status	Not married	587 (44)	309 (46)	278 (41)	0.0543
	Married	752 (56)	356 (54)	396 (59)	
Race	Other	108 (8)	30 (5)	78 (12)	<.0001
	Black	250 (19)	106 (16)	144 (21)	
	White	981 (73)	529 (80)	452 (67)	
Dependent variables					
Binge drinking	No	1229 (92)	608 (91)	621 (92)	0 .6372
	Yes	110 (8)	57 (9)	53 (8)	
Number of days(mean/sd)		0.45 (2.30)	0.55 (2.61)	0.35 (1.93)	0.5590

Note. p denotes a statistical test between the Reserve National Guard (RNG) and Active Component (AC) on the variable of interest.

Table 2. [†] Bivariate associations between any binge drinking (yes/no), demographic characteristics, deployment category, and rank

Variables	Reserve National Guard		Active Component	
	OR	95% CI	OR	95% CI
Deployment				
Elsewhere (ref. none)	0.93	(0.33, 2.63)	1.15	(0.43, 3.11)
Iraq or Afghanistan (ref. none)	2.71*	(1.19, 6.19)	2.26*	(1.10, 4.66)
Rank				
Enlisted (ref. officer)	4.85*	(1.79,13.18)	4.50*	(1.62, 12.50)
NCO (ref. officer)	3.86*	(1.60, 9.30)	3.83*	(1.46, 10.02)
Age	0.93*	(0.90, 0.96)	0.94*	(0.90, 0.98)
Married	0.52*	(0.30, 0.90)	0.47*	(0.27, 0.83)
Race				
Black (ref. white)	0.48	(0.19, 1.25)	0.33*	(0.13, 0.86)
Other (ref. white)	1.09	(0.32, 3.72)	0.50	(0.17, 1.44)

Notes. OR = odds ratio; CI = confidence interval; NCO = non-commissioned officer; [†]Logistic regression with binge drinking (yes/no) as the dependent variable; *p < .05.

Table 3. [†] Bivariate associations between frequency of binge drinking (number of days), demographic characteristics, deployment category, and rank.

Variables	Reserve National Guard		Active Component	
	b [‡]	95% CI	b [‡]	95% CI
Deployment				
Elsewhere (ref. none)	0.98	(-0.32, 2.27)	0.36	(-0.92, 1.63)
Iraq or Afghanistan (ref. none)	1.77*	(0.62, 2.91)	1.20*	(0.21, 2.18)
Rank				
Enlisted (ref. officer)	1.09	(-0.29, 2.46)	0.67	(-0.54, 1.88)
NCO (ref. officer)	0.85	(-0.15, 1.85)	0.84	(-0.19, 1.87)
Age	-0.06	(-0.11,-0.02)	-0.08	(-0.14,-0.02)
Married	-0.88	(-1.76,-0.01)	-0.51	(-1.38, 0.35)
Race				
Black (ref. white)	0.12	(-1.09, 1.33)	-0.78	(-1.86, 0.29)
Other (ref. white)	0.95	(-1.16, 3.06)	-1.14	(-2.56, 0.28)

Notes. CI = confidence interval; NCO = non-commissioned officer; [†] Generalized linear model using a negative binomial distribution with log link; [‡] regression coefficient; *p < .05

Table 4. Logistic regression models examining associations between any binge drinking (yes/no) and deployment and rank adjusting for age, marital status, and race/ethnicity.

Variable	Reserve National Guard		Active Component	
	OR (95% CI)	Predicted probability	OR (95% CI)	Predicted probability
Deployment category				
None	1	0.03	1	0.02 ^a
Elsewhere	1.09 (0.37, 3.23)	0.03	1.23 (0.44, 3.42)	0.03
Iraq or Afghanistan	2.12 (0.89, 5.02)	0.06	2.49* (1.15, 5.42)	0.05 ^a
Rank				
Enlisted	2.10 (0.70, 6.30)	0.05	3.92* (1.22, 12.54)	0.05 ^b
NCO	2.58* (1.03, 6.46)	0.06 ^c	3.73* (1.38, 10.11)	0.05 ^c
Officer	1	0.02 ^c	1	0.01 ^{b,c}

Notes: OR = odds ratio; CI = confidence interval; NCO = non-commissioned officer; pairwise comparisons with the same letters indicate a statistically significant difference between the two groups at .05; *p < .05.

Table 5. Log-linear models examining associations between days (in the past four weeks) binge drinking and deployment and rank adjusting for adjusting for age, marital status, and race/ethnicity.

Variable	Reserve National Guard		Active Component	
	b [†] (95% CI)	Predicted means (95% CI)	b [†] (95% CI)	Predicted Means (95% CI)
Deployment category				
None	0	0.13 (0.03, 0.49) ^a	0	0.07 (0.03, 0.17) ^a
Elsewhere	1.20 (-0.18, 2.58)	0.42 (0.14, 1.25)	0.82 (-0.72, 2.36)	0.15 (0.04, 0.57)
Iraq or Afghanistan	1.62* (0.40, 2.85)	0.65 (0.28, 1.48) ^a	1.24* (0.25, 2.23)	0.23 (0.12, 0.46) ^a
Rank				
Enlisted	1.47 (-0.15, 3.08)	0.52 (0.14, 1.92)	1.16 (-0.31, 2.63)	0.196 (0.08, 0.48)
NCO	1.56* (0.35, 2.77)	0.57 (0.21, 1.55) ^b	1.18* (0.003, 2.36)	0.20 (0.09, 0.46) ^b
Officer	0	0.12 (0.04, 0.38) ^b	0	0.06 (0.02, 0.21) ^b

Notes: CI = confidence interval; NCO = non-commissioned officer; pairwise comparisons with the same letters indicate a statistically significant difference between the two groups at .05; [†] regression coefficient; *p < .05.