

Post-deployment Mental Health in Reserve and National Guard Service Members: Deploying With or Without One's Unit and Deployment Preparedness

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ABSTRACT Background: Given the greater prevalence of post-deployment mental health concerns among reservists, the higher likelihood of deploying without their regular unit, and potentially lower rates of deployment preparedness, we examined associations between deploying with or without one's regular unit (individual augmentee status, IAS), deployment preparedness, and mental health problems including post-traumatic stress disorder (PTSD), depression (MDD), and binge drinking in a nationally representative sample of Reserve Component (RC) Army and Marine-enlisted males ($n = 705$). Methods: A series of multivariate regressions examined the association of mental health with IAS and deployment preparedness, adjusting for demographics. To examine whether deployment preparedness varied by IAS, an IAS \times deployment preparedness interaction was included. Findings: In an adjusted model, being an individual augmentee and low deployment preparedness were associated with any mental health problem (screening positive for PTSD, MDD, binge drinking, or any combination of the three). There was a significant IAS \times deployment preparedness interaction. Mental health problems did not vary by preparedness among individual augmentees. Participants deploying with regular units with low–medium preparedness had greater risk for mental health problems (odds ratio [OR] = 3.69, 95% confidence interval [CI] = 1.78–7.62 and OR = 2.29, 95% CI = 1.12–4.71), than those with high preparedness. RC-enlisted male personnel who deployed without their regular unit were five times more likely to have a mental health problem, and were 61% more likely to report binge drinking. Additionally, those with lower levels of deployment preparedness were up to three times more likely to have a mental health problem and up to six times more likely to report PTSD. Discussion: The current investigation found that both IAS and deployment preparedness were associated with negative mental health outcomes in a large representative sample of previously deployed RC-enlisted male personnel. In particular, low deployment preparedness was associated with an increased likelihood of PTSD, and deploying without one's regular unit was associated with increased rates of binge drinking. There were also significant main and interaction effects of IAS and deployment preparedness on having a mental health problem. It is possible that limiting the number of RC personnel deploying without their regular unit may help to decrease alcohol misuse among U.S. Armed Services reservists during and after future conflicts. Also, to the extent that deployment preparedness is a modifiable risk factor, future studies should examine whether increasing deployment preparedness could mitigate some of the correlates of deployment-related trauma exposure. Finally, future investigation is needed to explain why those who deploy without their regular unit, but who report high deployment preparedness, remain at elevated risk for mental health problems. It is possible that individual augmentees can benefit from a specific preparation for deployment. Those deploying without their regular unit had higher rates of mental health problems regardless of preparedness. These findings have implications for deployment preparedness training for those deploying without their regular unit.

The Reserve Component (RC) of the United States Armed Forces accounts for almost 40% of Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF) deployed forces.¹ In nationally representative studies of military service members^{2,3} as well as clinical samples of treatment-seeking veterans,⁴ Army and Marine reservists had substantially higher rates of combat exposure than other branches of service. Large surveys

of RC personnel have also found that they are at risk for mental health problems, e.g., post-traumatic stress disorder (PTSD) following deployment.^{5–9} RC personnel also have high rates of heavy weekly drinking, binge drinking, and other alcohol-related problems.^{10,11}

Compared with Active Component personnel, reservists are more likely to deploy as individual augmentees, in support of a unit other than their regular unit in both American¹² and British¹³ forces. Reservists who deploy without their regular unit may experience less social support,¹² and, therefore, may be at increased risk of mental health problems.^{14,15} However, empirical data on the mental health consequences of deploying without one's regular unit are scant. Of the two published studies in U.S. service members, neither found an association between individual augmentee status (IAS) and mental health outcomes.^{12,16} In contrast, of the four published studies in

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British service members,^{13,17–19} three found significant associations between IAS and adverse mental health outcomes.^{17–19} Differences in study populations (e.g., service branch, Active vs. RC, country of origin) may partially explain the differences between studies.

Differences in rates of mental health problems by IAS may be related to different levels of preparation for deployment. Reservists may be less prepared for the challenges of deployment compared with their AC counterparts. Reservists historically have received more limited training than AC personnel.²⁰ Lower levels of deployment preparedness have been associated with an increased likelihood of PTSD among reservists in large surveys.^{14,15,21,22} However, none of these studies has examined the association between deployment preparedness and other common mental health outcomes (e.g., depression and alcohol-related problems) among RC personnel.

Given the greater prevalence of post-deployment mental health concerns among reservists, the higher likelihood of deploying without their regular unit, and potentially lower rates of deployment preparedness, we examined these relationships in a representative sample of Army and Marine RC-enlisted male personnel, the branches which are most similar to each other and are most likely to experience significant combat exposure.^{2,4} We hypothesized that there would be significant associations of both deploying without one's regular unit as an individual augmentee and deployment preparedness with PTSD, major depressive disorder (MDD), and binge drinking.

METHOD

Sample and Procedures

Using a stratified random sampling procedure, 9,751 RC service members, serving as of June 2009, stratified by Reserves and National Guard, were recruited (described in detail elsewhere).³ After excluding individuals without a working telephone number ($n = 2,866$), those who did not wish to participate ($n = 1,097$), and those who were not contacted because the target sample size was reached ($n = 3,386$), a total of 2,402 were contacted by phone for participation. Of those contacted, 324 were not eligible (e.g., no longer in the RC or retired), 61 were disqualified because they lacked sufficient English fluency or had hearing problems, and 14 started but did not finish the survey, resulting in a sample of 2,003. The sample was weighted to be representative of the RC population with respect to military branch and characteristics including pay grade, age, gender, and race. Interviews were conducted between January and July, 2010 and data were analyzed in 2015. Among the subsample of 950 enlisted males in Army and Marine services, 705 had been deployed in their lifetime and constituted the current sample.

The study protocol was approved by the U.S. Army Medical Command's Congressionally Directed Medical Research Program unit, the U.S. Army Medical Research & Materiel Command's Human Research Protection Office, and the

Institutional Review Boards of the Uniformed Services University of the Health Sciences and Columbia University.

Measures

Demographics

Demographic variables included age, race (Caucasian, African-American, and Other), marital status (currently, previously, and never married), and rank (E1–E4 and E5–E9) based on previous associations of these demographic variables with mental health outcomes.

Post-Traumatic Stress Disorder

The PTSD Checklist-Civilian (PCL-C) evaluated PTSD symptoms based on DSM-IV criteria.²³ Participants were included in the PTSD group if they indicated traumatic events occurred on their most recent deployment, screened positive for symptoms meeting all DSM-IV criteria at a moderate or greater level of intensity, experienced symptoms of least 1 mo duration (Criterion E), had clinically significant impairment or distress (Criterion F), and reported symptoms in the past year. Participants who endorsed (1) that it was very or extremely difficult to do their work, take care of things at home, or get along with other people, or (2) experienced moderate or greater distress, were considered to have clinically significant impairment or distress.

Major Depressive Disorder

The Patient Health Questionnaire (PHQ-9) was used to assess DSM-IV criteria depressive symptoms.²⁴ Participants were included in the MDD group if they screened positive for symptoms that had been present at least "more than half the days" in the past 2 wk, at least one of the symptoms was depressed mood or anhedonia, and if the symptoms occurred together. MDD was considered current if all symptoms were met in the past year.

Binge Drinking

Participants were asked how many drinks they consumed on the days they drank alcohol over the past 30 d. A drink was defined as one can or bottle of beer, one glass of wine, one can or bottle of wine cooler, one cocktail, or one shot of liquor. Binge drinking was defined as six or more drinks per day.^{25,26}

Any Mental Health Problem (PTSD, MDD, binge drinking, or any combination of the three)

Participants were coded as having a current mental health problem if they met criteria for past year PTSD, past year MDD, or past month binge drinking (includes participants who screened positive for PTSD, MDD, binge drinking, or any combination of the three).

Deploying With or Without One's Regular Unit (IAS)

Participants were asked whether they deployed with or without their regular unit. Those who deployed without their

regular unit deployed as an individual mobilization augmentee, i.e., as a “filler” to a unit other than the one they were normally assigned to during their most recent deployment. A binary variable was created for most recent deployment with or without regular unit.

Deployment Preparedness

Selected items from the Preparedness subscale of the Deployment Risk and Resilience Inventory (DRRI)^{27,28} were used to measure deployment preparedness. The DRRI is a self-report research inventory of risk and resilience factors associated with military deployment. The developers intended that each of the 14 measures could be used together, or individually as “stand-alone” instruments. In OEF/OIF veterans, the DRRI has strong internal consistency and both criterion and discriminative validity.²⁹ Participants were asked to rate their level of agreement with the following items from the DRRI Preparedness Scale: 1) I had all the supplies and equipment needed to get my job done; 2) the equipment I was given functioned the way it was supposed to; 3) I received adequate training on how to use my equipment; 4) I was accurately informed about what to expect from the enemy; and 5) I was accurately informed of what daily life would be like during my deployment. Responses range from “strongly disagree” (1) to “strongly agree” (5). Cronbach’s alpha for the scale was 0.71. A mean score of the five items was calculated for each participant and participants were then categorized into three groups that were comparable in size: low (1–4), medium (4–4.6), and high (4.6–5).

Analysis

For each mental health outcome (PTSD, MDD, binge drinking, and any mental health problem), analyses consisted of descriptive statistics, the Wald Chi-square statistics, and a series of logistic regression analyses. Descriptive statistics reported the prevalence of each outcome among the total sample and by each categorical predictor, including demographics, IAS, and deployment preparedness. Wald Chi-square statistics examined if weighted percentage of PTSD, MDD, binge drinking, or any mental health problem differed by demographics, IAS, or deployment preparedness. Univariate logistic regressions examined the bivariate association between each outcome and the predictors. A series of multivariate regressions examined the association of mental health with IAS and deployment preparedness, adjusting for demographics. To examine whether deployment preparedness varied by IAS, an IAS × deployment preparedness interaction was included. Analyses were conducted using SAS-callable SUDAAN statistical software, with adjustments for survey stratification and weighting.³⁰

RESULTS

The average age of participants was 32.7 yr (SD = 9.3), with a range of 19–59. Slightly over one-third of participants (36.5%, $n = 257$) had a military rank of E1–E4 and 63.6% ($n = 448$)

were E5–E9. Slightly more than half of participants (54.6%, $n = 384$) were currently married, 32.5% ($n = 229$) had never been married, and 12.9% ($n = 91$) were previously married. A total of 75.5% ($n = 531$) were Caucasian, 12.7% ($n = 89$) were African-American, 5.4% ($n = 38$) were Hispanic, 2.6% ($n = 18$) were Asian, 1.7% ($n = 12$) were American Indian or Alaska Native, and 2.1% ($n = 15$) were other. Slightly more than one-third of participants (34.7%, $n = 243$) deployed without their regular unit during the most recent deployment. Deployment preparedness was reported to be low in 34.2% ($n = 241$) of participants, medium in 43.0% ($n = 303$), and high in 22.8% ($n = 161$).

Post-Traumatic Stress Disorder

The prevalence of individuals screened as positive for symptoms consistent with a diagnosis of PTSD was 6.6% ($n = 43$) (those with PTSD differed by marital status [$\chi^2 = 3.1$, $p < 0.05$] and by deployment preparedness [$\chi^2 = 6.3$, $p < 0.01$]) (Table I). In univariate analyses, PTSD was not significantly associated with any sociodemographic variables or IMA (Table II). However, those with low deployment preparedness were more likely to have PTSD compared with those with high deployment preparedness (odds ratio [OR] = 5.85, 95% confidence interval [CI] = 1.53–22.41). In fully adjusted models, deploying without one’s regular unit was not associated with PTSD. Those with lower levels of deployment preparedness were up to six times more likely to have PTSD (low vs. high OR = 6.02, 95% CI = 1.66–21.92, medium vs. high OR = 3.95, 95% CI = 1.03–15.18) (Table III). An IES × deployment preparedness interaction effect could not be examined because of the small n .

Major Depressive Disorder

The prevalence of individuals screened as positive for symptoms consistent with a diagnosis of MDD was 9.4% ($n = 64$) (there were racial differences among participants with MDD [$\chi^2 = 3.3$, $p < 0.05$]) (Table I). In univariate analyses, MDD was not associated with any demographic variables or IMA (Table II). Those with low deployment preparedness were more likely to have MDD (OR = 2.22, 95% CI = 1.03–4.81) (Table III). Adjusting for sociodemographics, there were no significant associations between MDD and either IAS or deployment preparedness. The IAS × deployment preparedness interaction was not significant.

Binge Drinking

The prevalence of individuals screened as positive for symptoms consistent with binge drinking was 17.4% ($n = 119$) (Table I). Those with current binge drinking differed by race ($\chi^2 = 10.2$, $p < 0.001$), marital status ($\chi^2 = 10.0$, $p < 0.001$), and rank ($\chi^2 = 13.6$, $p < 0.001$). In univariate analyses, binge drinking decreased with older age (Table II). Individuals who had a lower rank were never or previously married and Caucasian were more likely to binge drink. There

TABLE I. Mental Health Problems by Socioemographic Characteristics, Deployment Preparedness, and Individual Augmentee Status^a

	No Mental Health Problem			PTSD Past Year			MDD Past Year			Binge Drinking Past Month			Mental Health Problem Past Year ^b		
	n	Wt. n	Wt%	n	Wt. n	Wt%	n	Wt. n	Wt%	n	Wt. n	Wt%	n	Wt. n	Wt%
Total (n = 705)	466	214,105	70.8	43	19,528	6.6	64	30,328	9.4	119	56,607	17.4	188	88,282	29.2
Rank															
E1–E4 (n = 257)	153	74,173	65.0*	14	5,933	5.5	26	12,984	10.6	63	30,933	25.1***	84	39,870	35.0*
E5–E9 (n = 448)	313	140,168	74.3	29	13,595	7.3	38	17,344	8.6	56	25,673	12.7	104	48,412	25.7
Marital status															
Currently married (n = 384)	279	125,116	76.9**	24	11,793	7.4*	31	15,087	8.7	40	19,235	11.0***	79	37,557	23.1**
Never been married (n = 229)	139	66,448	64.6	9	3,584	3.6	20	9,562	8.7	61	29,480	26.7	75	36,380	35.4
Previously married (n = 91)	47	22,350	60.9	10	4,151	11.5	13	5,679	14.3	18	7,891	19.5	34	14,345	39.1
Race															
Caucasian (n = 531)	339	163,197	66.9***	31	16,012	6.8	54	27,212	10.6*	101	51,604	19.9***	160	80,908	33.1***
African-American (n = 89)	71	41,481	91.5	4	2,191	4.9	4	2,191	4.2	5	2,808	5.3	7	3,846	8.3
Other (n = 83)	54	9,427	72.8	8	1,325	10.3	6	925	6.6	13	2,194	15.9	21	3,528	26.6
Deployment preparedness															
Low (n = 241)	148	66,277	64.5**	23	9,811	10.0**	31	14,692	13.4	40	18,607	16.9	79	36,537	35.5**
Medium (n = 303)	201	95,487	70.9	17	8,519	6.4	22	11,009	7.7	59	28,439	19.8	81	39,222	29.1
High (n = 161)	117	52,576	80.8	3	1,198	1.9	11	4,628	6.5	20	9,561	13.3	28	12,524	19.2
IAS															
Deployed w/regular unit (n = 457)	320	147,585	75.3**	24	11,835	6.1	34	17,473	8.2	67	31,990	15.0	100	48,505	24.7**
Deployed w/o regular unit (n = 243)	144	66,238	63.3	19	7,693	7.7	30	12,855	11.8	49	23,178	21.1	85	38,339	36.7

^aWald Chi-square test statistics were used to examine if weighted percentage of PTSD, MDD, binge drinking and any mental health problem differed by demographics, deployment preparedness, and IAS. **p* < 0.05 ***p* < 0.01 ****p* < 0.001. ^bParticipants were coded as having a mental health problem in the past year if based on the survey, they were diagnosed with any of the following: post-traumatic stress disorder (PTSD) in relation to their most recent deployment, major depressive disorder (MDD), or binge drinking (six or more drinks per day).

TABLE II. Univariate Associations of Sociodemographic Characteristics, Deployment Preparedness, and Individual Augmentee Status with Mental Health Problems

	PTSD Past Year	MDD Past Year	Binge Drinking Past Month	Mental Health Problem Past Year
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Age	1.02 (0.99–1.05)	1.00 (0.98–1.03)	0.95 (0.93–0.98)	0.98 (0.96–1.00) ^a
Rank				
E1–E4 (n = 257)	0.73 (0.36–1.49)	1.26 (0.72–2.18)	2.31 (1.52–3.53)	1.56 (1.08–2.24)
E5–E9 (n = 448)	1.00	1.00	1.00	1.00
Marital status				
Currently married (n = 384)	1.00	1.00	1.00	1.00
Never been married (n = 229)	0.47 (0.20–1.11)	1.00 (0.54–1.86)	2.94 (1.85–4.67)	1.82 (1.23–2.71)
Previously married (n = 91)	1.62 (0.71–3.71)	1.75 (0.85–3.63)	1.95 (1.03–3.70)	2.14 (1.25–3.65)
Race				
Caucasian (n = 531)	1.00	1.00	1.00	1.00
African-American (n = 89)	0.71 (0.24–2.09)	0.37 (0.13–1.07)	0.23 (0.09–0.58)	0.19 (0.08–0.42)
Other (n = 83)	1.58 (0.68–3.65)	0.60 (0.24–1.49)	0.76 (0.40–1.46)	0.75 (0.43–1.32)
Deployment preparedness				
Low (n = 241)	5.85 (1.53–22.41)	2.22 (1.03–4.81)	1.33 (0.72–2.46)	2.31 (1.36–3.93)
Medium (n = 303)	3.59 (0.92–14.00)	1.21 (0.54–2.69)	1.61 (0.90–2.88)	1.72 (1.03–2.90)
High (n = 161)	1.00	1.00	1.00	1.00
IAS				
Deployed w/regular unit (n = 457)	1.00	1.00	1.00	1.00
Deployed w/o regular unit (n = 243)	1.27 (0.65–2.46)	1.50 (0.87–2.59)	1.52 (0.98–2.33)	1.76 (1.22–2.55)

Note. Logistic regression was conducted for each outcome variable with each demographic and deployment variable, while controlling for complex survey design. An association is considered statistically significant if the 95% confidence interval excludes 1.

^a1 was excluded in the 95% confidence interval, *p* = 0.037.

TABLE III. Multivariate Associations of Sociodemographic Characteristics, Deployment Preparedness, and IAS with Mental Health Problems

	PTSD Past Year	MDD Past Year	Binge Drinking Past Month	Mental Health Problem Past Year
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Age	1.00 (0.96–1.04)	1.01 (0.97–1.04)	0.98 (0.95–1.02)	1.00 (0.97–1.02)
Rank				
E1–E4 (<i>n</i> = 257)	0.88 (0.41–1.91)	1.38 (0.71–2.68)	1.57 (0.96–2.56)	1.28 (0.83–1.98)
E5–E9 (<i>n</i> = 448)	1.00	1.00	1.00	1.00
Marital status				
Currently married (<i>n</i> = 384)	1.00	1.00	1.00	1.00
Never been married (<i>n</i> = 229)	0.46 (0.19–1.09)	0.92 (0.47–1.83)	2.39 (1.37–4.17)	1.70 (1.05–2.73)
Previously married (<i>n</i> = 91)	1.66 (0.71–3.89)	1.68 (0.82–3.43)	2.04 (1.03–4.05)	2.32 (1.32–4.08)
Race				
Caucasian (<i>n</i> = 531)	1.00	1.00	1.00	1.00
African-American (<i>n</i> = 89)	0.77 (0.26–2.32)	0.41 (0.14–1.19)	0.25 (0.09–0.68)	0.21 (0.09–0.50)
Other (<i>n</i> = 83)	1.67 (0.72–3.89)	0.55 (0.22–1.39)	0.80 (0.39–1.64)	0.74 (0.42–1.32)
Deployment preparedness				
Low (<i>n</i> = 241)	6.02 (1.66–21.92)	2.09 (0.95–4.63)	1.12 (0.57–2.19)	3.66 (1.74–7.70)
Medium (<i>n</i> = 303)	3.95 (1.03–15.18)	1.19 (0.53–2.67)	1.61 (0.85–3.05)	2.32 (1.12–4.84)
High (<i>n</i> = 161)	1.00	1.00	1.00	1.00
IAS				
Deployed w/regular unit (<i>n</i> = 457)	1.00	1.00	1.00	1.00
Deployed w/o regular unit (<i>n</i> = 243)	1.04 (0.54–2.01)	1.36 (0.77–2.41)	1.61 (1.01–2.56)	5.10 (1.91–13.64)

Note. Logistic regression was conducted for each outcome variable with all demographic and deployment variables, while controlling for complex survey design. An association is considered statistically significant if the 95% confidence interval excludes.

were no significant univariate associations between binge drinking and IAS.

In fully adjusted models, binge drinking was associated with marital status and race (Table III). Those who were never married (OR = 2.39, 95% CI = 1.37–4.17) or previously married (OR = 2.04, 95% CI = 1.03–4.05) were more likely to binge drink than those currently married. African-Americans were less likely to binge drink than Caucasians (OR = 0.25, 95% CI = 0.09–0.68). Individuals who deployed without their regular unit were more likely to binge drink (OR = 1.61, 95% CI = 1.01–2.56). Deployment preparedness was not associated with binge drinking. The IAS × deployment preparedness interaction was not significant.

Any Mental Health Problem

Approximately 29% (*n* = 188) had a current mental health problem (screening positive for PTSD, MDD, binge drinking, or any combination of the three) (Table I). There were differences for those with a mental health problem by race ($\chi^2 = 15.1, p < 0.001$) and rank ($\chi^2 = 5.4, p < 0.05$). The prevalence of individuals screened as positive for symptoms consistent with having a mental problem differed between those who were deployed with their regular unit (*n* = 100, 24.7%) and without their regular unit (*n* = 85, 36.7%; $\chi^2 = 8.6, p = 0.003$). In univariate analyses, the presence of a mental health problem decreased with older age (Table II). Individuals who had a lower rank were previously or never married, and Caucasian were more likely to have a mental health problem.

Individuals who deployed without their regular unit were at greater risk of having a mental health problem (OR = 1.76, 95% CI = 1.22–2.55). Those with low (OR = 2.31, 95% CI = 1.36–3.93) or medium (OR = 1.72, 95% CI = 1.03–2.90) deployment preparedness were more likely to have a mental health problem compared with those with high preparedness.

In fully adjusted models, having a mental health problem was associated with marital status and race (Table III). In particular, those who were either never married (OR = 1.70, 95% CI = 1.05–2.73) or previously married (OR = 2.32, 95% CI = 1.32–4.08) were more likely to have a mental health problem compared with those who were currently married. African-Americans were less likely to have a mental health problem than Caucasians (OR = 0.21, 95% CI = 0.09–0.50). Individuals who deployed without their regular unit were five times more likely to have a mental health problem (OR = 5.10, 95% CI = 1.91–13.64). Both those with low (OR = 3.66, 95% CI = 1.74–7.70) and medium (OR = 2.32, 95% CI = 1.12–4.84) preparedness were more likely to have a mental health problem compared with those with high preparedness.

There was a significant IAS × deployment preparedness interaction (Wald *F* = 4.07, *p* < 0.05). Post-hoc analyses revealed that among individual augmentees, there was no association between deployment preparedness and mental health problems (35.2%, 37.6%, and 37.8% of those with low, medium, and high preparedness, respectively, reported any mental health problem, see Fig. 1). Those who deployed with their regular unit and had a low (OR = 3.69, 95% CI = 1.78–7.62) or medium (OR = 2.29, 95% CI = 1.12–4.71)

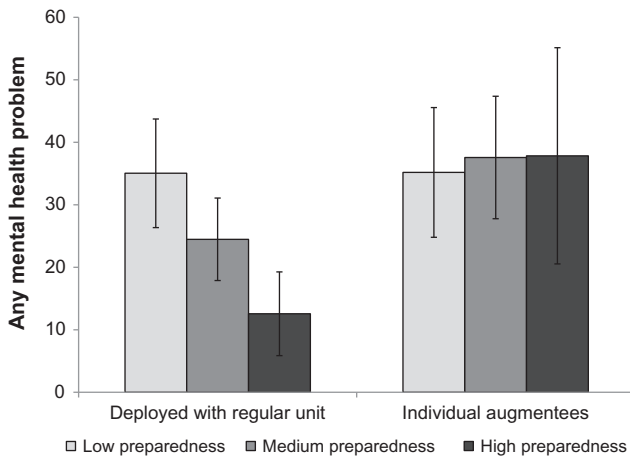


FIGURE 1. Any mental health problem by level of IAS and deployment preparedness. *Note.* Error bars represent 95% confidence intervals. Among deployed with regular unit, low preparedness: $n = 133$, medium preparedness: $n = 179$, and high preparedness: $n = 108$; among individual augmentees, low preparedness: $n = 91$, medium preparedness: $n = 103$, and high preparedness: $n = 35$.

level of preparedness were at greater risk for a mental health problem (Wald $F = 6.30$, $p < 0.01$). Similarly, there was no difference between low and medium preparedness levels (35.0%, 24.5%, and 12.6% of those with low, medium, and high preparedness, respectively, reported any mental health problem).

DISCUSSION

Few prior studies have investigated deploying without one’s regular unit and deployment preparedness as potential risk factors for mental health outcomes. To our knowledge, none have focused primarily on RC personnel. The current study found that RC-enlisted male personnel who deployed without their regular unit were five times more likely to have a mental health problem, and were 61% more likely to report binge drinking. Additionally, those with lower levels of deployment preparedness were up to three times more likely to have a mental health problem and up to six times more likely to report PTSD. Importantly, the association of preparedness with mental health was moderated by whether one deployed with one’s usual unit (IAS).

Those who deployed without their regular unit were at increased risk of both binge drinking and having any mental health problem, similar to prior studies,^{17–19} but not of PTSD. Conversely, in British service members, those who deployed without their regular unit were less likely to misuse alcohol.¹³ Differences in sample and methodology may partially explain the differing results. Although IAS has been found to be associated with PTSD in prior studies,^{17–19} the lack of significant findings in the current study may be due, in part, to methodological differences across studies.

RC personnel with low deployment preparedness had the highest prevalence of mental health problems. Those with low preparedness were over six times more likely to have PTSD

and over three times more likely to have any mental health problem. This is consistent with prior studies which have found lower levels of deployment preparedness associated with PTSD among RC personnel.^{14,15,21,22} None of these prior studies, however, examined other mental health outcomes, such as depression and binge drinking, as were examined in the current study. We did not find significant independent associations with depression or binge drinking, suggesting that low preparedness is uniquely associated with PTSD. Perhaps being less prepared may render service members particularly vulnerable to the effects of deployment-related trauma exposure. There are several unique aspects of the trauma exposures in Iraq and Afghanistan (e.g., improvised explosive devices, urban warfare, counterinsurgency) for which service members may have felt especially less prepared, particularly during the early phases of these conflicts.¹⁵

Current results suggest that the association of mental health problems and deployment preparedness varied by IAS. For those who deployed with their regular unit, the higher their level of deployment preparedness, the lower their risk of mental health problems. This dose–response relationship has also been found in prior research.^{14,15,21,22} However, individual augmentees were at a uniformly increased risk regardless of preparedness. Those who deployed without their regular unit were at higher risk for adverse mental health regardless of their level of preparedness. Thus, for those who deployed with their regular unit, higher levels of preparedness appeared to confer some protection against current mental health problems. This finding is novel and somewhat unexpected, and warrants further investigation.

Several limitations to this study should be noted. First, the current study was underpowered for some analyses. It should be noted that the confidence intervals, although statistically significant, are very large for the association between PTSD and deployment preparedness, and between IAS and having any mental health problem, due to the small sample size for these analyses. Further studies using larger samples are needed. Second, the current data are cross-sectional, and thus conclusions are limited by this design, e.g., we are unable to make causal inferences because we are not looking at two or more points in time compared with a longitudinal design. Third, military selection procedures for deployment may differ for RC personnel compared with Active Duty, affecting the overall generalizability of the current findings. Fourth, although a limitation of the current study is the use of self-report instruments, a strength is that the PTSD and depression measures have been extensively validated and show good sensitivity and specificity, and similar definitions of binge drinking have been used in other studies.²⁶ Fifth, current PTSD and depression included cases within the past year, whereas current binge drinking included only cases within the past month, thus limiting comparisons.

In summary, the current investigation found that both IAS and deployment preparedness were associated with negative mental health outcomes in a large representative sample of

previously deployed RC-enlisted male personnel. In particular, low deployment preparedness was associated with an increased likelihood of PTSD, and deploying without one's regular unit was associated with increased rates of binge drinking. There were also significant main and interaction effects of IAS and deployment preparedness on having a mental health problem. It is possible that limiting the number of RC personnel deploying without their regular unit may help to decrease alcohol misuse among U.S. Armed Services reservists during and after future conflicts. Also, to the extent that deployment preparedness is a modifiable risk factor, future studies should examine whether increasing deployment preparedness could mitigate some of the correlates of deployment-related trauma exposure. Finally, future investigation is needed to explain why those who deploy without their regular unit, but who report high deployment preparedness, remain at elevated risk for mental health problems. It is possible that individual augmentees can benefit from a specific preparation for deployment.

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CONFLICT OF INTEREST

The authors declare that they do not have any conflicts of interest.

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