

Association Between Number of Deployments to Iraq and Mental Health Screening Outcomes in US Army Soldiers

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Objective: High rates of mental health concerns have been documented in US Army soldiers deployed in support of Operation Iraqi Freedom. The goal of this study was to compare the post-deployment mental health screening results of US Army soldiers with 1 or 2 deployments to Iraq.

Method: Routine mental health screening data collected from September 7, 2005, to April 27, 2007, in the Soldier Wellness Assessment Program were compared between soldiers evaluated after their first or second deployment to Iraq (n = 1322). Standardized measures (Primary Care Evaluation of Mental Disorders Patient Health Questionnaire, Primary Care Posttraumatic Stress Disorder Screen, Alcohol Use Disorders Identification Test) were used to screen for posttraumatic stress disorder (PTSD), panic, other anxiety, major depression, other depression, and hazardous alcohol consumption 90 to 180 days after the soldiers returned from Iraq.

Results: There was a significant association between number of deployments and mental health screening results such that soldiers with 2 deployments showed greater odds of screening positive for PTSD (odds ratio [OR]=1.64, $P = .001$). Similar results were observed when the analyses were repeated utilizing a more conservative cut-point for PTSD (OR = 1.60, $P = .001$). After adjustment for demographic characteristics, the results were unchanged. There was no association between the number of deployments and other mental health screening results.

Conclusions: These results provide preliminary evidence that multiple deployments to Iraq may be a risk factor for PTSD. However, these cross-sectional data require replication in a longitudinal study.

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The number of mental health patients presenting in military, Veterans Affairs (VA), and community mental health clinics with a history of a deployment to Iraq is growing. Since the invasion of Iraq (Operation Iraqi Freedom; OIF) in March 2003, hundreds of thousands of US soldiers have deployed to Iraq,¹ and about 67% report potentially traumatic combat experiences.² The impact of deployment and combat exposure on mental health functioning is an important public health issue, not only for the military, but also for the civilian mental health community, as soldiers with mental health concerns are discharged to civilian status faster than soldiers without mental health problems.³

Several seminal studies have begun to clarify the impact of deployment to Iraq on mental health functioning. In an early study by Hoge and colleagues,⁴ soldiers assessed 3 to 4 months after a deployment to Iraq screened positive for “strict” posttraumatic stress disorder (PTSD) criteria in 13% of cases; screening rates for depression and generalized anxiety were each observed in about 8% of cases, and alcohol misuse was observed in over 20% of cases. With the exception of generalized anxiety, these rates were significantly higher than predeployment screening rates observed in a comparable US Army unit. In a separate study, routine postdeployment screening data collected within 2 weeks of returning from Iraq revealed that Army soldiers and Marines screened positive for a mental health problem in 19% of cases, compared to 8.5% returning from operational locations other than Iraq or Afghanistan (Operation Enduring Freedom; OEF).³

Similar results have been reported in veteran populations. Examining over 103,000 OIF/OEF veterans, Seal and colleagues⁵ reported that 25% of health care patients in the VA system had been diagnosed with a mental health disorder, including 13% with PTSD. The rate of PTSD diagnoses in a similar VA sample was reportedly 3.7 times higher among Army soldiers or Marines who served in ground units in Iraq or Afghanistan compared to Navy or Air Force veterans of OIF/OEF.⁶ Thus, several independent studies have documented high rates of mental health concerns in Army soldiers deployed in support of OIF.

The importance of these results is underscored by the impact of anxiety disorders on patients’ emotional, social, and physical well-being. The National Survey of the

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Vietnam Generation revealed that veterans with lifetime diagnoses of PTSD and major depression showed significantly lower employment rates and hourly wages compared to veterans without these disorders.⁷ PTSD has been associated with increased marital distress and parental adjustment problems.^{8,9} In addition, OIF/OEF veterans with PTSD or hazardous alcohol consumption reported a lower quality of life.¹⁰ Furthermore, soldiers studied 1 year after deployment to OIF showed strong associations between PTSD and physical health problems.¹¹ OIF veterans with mental disorders may face impairments in job performance, intimate and family relationships, quality of life, and physical health.

There is currently speculation as to whether multiple deployments to Iraq may exacerbate the frequency and severity of mental health problems described above. Multiple deployments increase the probability that a soldier will be exposed to combat and may also increase the cumulative stress an individual experiences. Deployment stressors can include a sense of isolation, relationship stress, home-front problems, challenges associated with adjusting to a new environment, a threatened sense of safety, traumatic stress, long work hours, and stressors associated with a variety of other operational demands. Concomitant reductions in usual coping resources (eg, access to friends and family, hobbies, time alone) may also impact mental health functioning. In contrast, potential protective factors such as unit cohesion, effective leadership, mentoring, training, and access to other resources in theater may mediate the impact of deployment stress.

To our knowledge, no peer-reviewed studies have examined the impact of multiple OIF deployments on mental health functioning in US military personnel. Internal Army studies have reported mixed results.¹²⁻¹⁴ A study of United Kingdom (UK) Armed Forces personnel has been conducted and revealed no significant association between number of deployments in the last 3 years and screening results on measures of PTSD or psychological distress.¹⁵ However, unlike most US soldiers, many of the subjects in the UK study were deployed for short periods. Previous studies of US and UK service members suggest that results from one cohort may not generalize to the other.^{3,4,16}

There is evidence that exposure to multiple traumas may increase the risk for mental health problems. For example, a Swedish study of 1,824 randomly selected individuals from the general population revealed that trauma frequency was significantly associated with an increased risk of PTSD.¹⁷ Similar results have been noted in patients hospitalized at trauma centers.¹⁸ In addition, among service members who worked in a mortuary during the Persian Gulf War, greater changes in PTSD symptoms were observed in groups with the greatest exposure to human remains.¹⁹

The purpose of this study was to determine if there is a relationship between multiple deployments to Iraq and mental health problems as identified by mental health screening outcomes for US soldiers with 1 or 2 deployments to Iraq.

Given the mixed reasons to predict differential outcomes, we had no a priori hypotheses.

METHOD

Study Population

Data were retrospectively analyzed from the Soldier Wellness Assessment Program (SWAP) database at a large military medical facility. The SWAP is an extension of a standard postdeployment screening program conducted throughout the Army and Department of Defense (the Post-Deployment Health Reassessment program).²⁰ The SWAP provides a global health assessment, including mental health screening, for all soldiers 90 to 180 days after returning from an operational deployment. During the SWAP process, soldiers first completed a set of screening measures and additional items on demographics, military information, psychosocial history, and deployment exposures and stressors on a computer. Soldiers were seen by medical personnel for injury prevention, smoking cessation, or other reported physical concerns as needed, and a credentialed behavioral health provider met individually with each soldier. A nurse practitioner reviewed all aspects of the soldier's SWAP encounters, and administrative support staff met with each soldier to schedule follow-up appointments.

The SWAP's postdeployment screening data from September 7, 2005, to April 27, 2007, were analyzed. All service members in the database were regular, active duty soldiers. Cases were included in the analysis if they met 2 criteria: (1) Iraq was reported as the deployment's operational location and (2) the total historical number of reported deployments in support of OIF was 1 or 2. There were not enough soldiers with 3 deployments in the database to expand the analysis to include this group. Cases were included when the soldiers were screened within at least 60 days of the target postdeployment timeframe. Soldiers with reported histories of deployment in support of OEF were excluded from the analysis. Based on these criteria, 661 soldiers were evaluated after their second deployment to Iraq. Soldiers returning from a first deployment to Iraq were randomly matched to those returning from a second deployment in a 1-to-1 ratio according to primary Army job and total combat exposure. Job type was defined as Infantry (n = 55; 4%), Armor (n = 26; 2%), Field Artillery (n = 23; 2%), Air Defense Artillery (n = 24; 2%), Aviation (n = 54; 4%), Special Forces (n = 24; 2%), Engineer (n = 196; 15%), or Non-Combat Arms (all other jobs; n = 920; 70%), and total combat exposure was calculated from a combat exposure scale (see Measures). For 22 Aviation cases, there was no match available in the cohort with 1 deployment; these cases were randomly matched to any Combat Arms case in the group with 1 deployment. Therefore, the final sample included in the analysis was 1,322 cases. The study was approved by the Department of Clinical Investigations.

Measures

Screening measures included the depression and anxiety modules from the Primary Care Evaluation of Mental Disorders Patient Health Questionnaire (PHQ),²¹⁻²³ the Primary Care Posttraumatic Stress Disorder Screen (PC-PTSD),²⁴ and the Alcohol Use Disorders Identification Test (AUDIT).²⁵ In addition, 4 combat exposure items were adapted from the Deployment Risk and Resilience Inventory.²⁶

Primary Care Evaluation of Mental Disorders Patient Health Questionnaire. The PHQ is a self-report measure that can be entirely patient-administered to screen for threshold disorders that correspond to specific *DSM-IV* criteria and subthreshold disorders that require fewer symptoms than a *DSM-IV* diagnosis.²¹ The Depression and Anxiety modules administered in the SWAP provide screening results for threshold disorders, including major depression, panic disorder, and other anxiety disorder; the subthreshold disorder of other depressive disorder is also examined. Standardized algorithms described elsewhere^{21,27,28} were used to determine screening outcomes. Briefly, if 5 of the 9 depression items are endorsed for more than half the days, and one is anhedonia and/or depressed mood, major depression is suggested. Other depressive disorder is suggested if 2, 3, or 4 items are endorsed more than half the days and include anhedonia and/or depressed mood. In order to suggest the presence of panic disorder, all of the 5 panic symptom items must be endorsed. Other anxiety disorder is suggested if anxiety or worry is endorsed for "several or more days" over the past 4 weeks and 3 or more of the remaining 6 anxiety items are endorsed as occurring "more than half the days." The PHQ is widely used and has established reliability and validity.^{21,22,29,30}

Primary Care Posttraumatic Stress Disorder Screen. The PC-PTSD is a brief, 4-item (yes-no) self-report screening instrument for PTSD that is a standard part of the Army's routine postdeployment screening program. The PC-PTSD demonstrated sound psychometric properties for cutoff scores of 2 (sensitivity = 0.91, specificity = 0.72) and 3 (sensitivity = 0.78, specificity = 0.87) compared to diagnoses based on the Clinician Administered Scale for PTSD.²⁴ Since cutoff scores of either 2 or 3 may be appropriate, depending on the clinical setting,²⁴ we analyzed results for both cut-points (PTSD-2, PTSD-3).

Alcohol Use Disorders Identification Test. The AUDIT is a 10-item self-report measure that screens for hazardous or harmful alcohol consumption.²⁵ Item responses range from 0 (never) to 4 (daily or almost daily) with total scores ranging from 0 to 40. The standard cutoff score of 8 for hazardous or harmful consumption has consistently demonstrated favorable sensitivity and specificity in numerous studies.³¹⁻³⁴ The AUDIT is internally consistent³⁵ and has shown good test-retest reliability.³⁶

Combat exposure. Screening items included 4 yes-no questions about combat experienced during the most recent deployment, adapted from the Deployment Risk and

Resilience Inventory.²⁶ Items asked the following: During combat operations, did you (1) become wounded or injured; (2) personally witness a unit member, ally, enemy, or civilian being killed; (3) see the bodies of dead soldiers or civilians; (4) kill others in combat (or have reason to believe others were killed as result of your actions)?

Statistical Analyses

Chi-square tests of association and *t* tests were used to compare demographic and combat exposure variables between groups with 1 or 2 Iraq deployments. Logistic regression was used to examine associations between the number of Iraq deployments and mental health screening outcomes (positive, negative). Multivariate logistic regression models were used to examine the associations irrespective of age, sex, race/ethnic background, rank, education, and marital status.

RESULTS

Subject Characteristics

Subject demographics are presented in Table 1. All data presented for the cohort with 2 deployments represent information collected following their second deployment; data related to their first deployment likely exist in the Army's enterprise databases, but the data were not in the SWAP database, and our research team did not have access to the information. Soldiers with 2 Iraq deployments differed from those with 1 deployment in terms of age, rank, education, and marital status. There was no difference between the groups in racial/ethnic background or sex. Groups did not differ on individual combat exposure items (Table 2). The sample was comparable to the gender distribution of population-level data for soldiers who are postdeployed from OIF (10.0% vs 10.6% female, respectively).³ The sample in the current study contained fewer young soldiers compared to the postdeployed population (27% vs 45% were 18-24 years of age). Therefore, the sample also contained a higher percentage of married (60% vs 48%) and senior enlisted soldiers (53% vs 37%) compared to the postdeployed population. These differences are due in part to the fact that cases with 2 deployments were selected for inclusion in this study, and therefore older subjects are overrepresented in the sample compared to the deployed population.

There was no difference between soldiers with 1 or 2 deployments in terms of the number of days between departure from theater and screening date (mean \pm SD = 109.56 \pm 36.69 and 108.56 \pm 35.81, respectively). For the group with 1 deployment, soldiers were deployed for a mean of 319.34 days (SD = 76.59); for the group with 2 deployments, soldiers were deployed for a mean of 319.69 days (SD = 83.31; not counting time deployed during their first tour to Iraq, which was unknown). For soldiers with 2 deployments, the median arrival date in theater (October 31, 2005) was about

Table 1. Demographic Characteristics of 1322 US Army Soldiers Evaluated After Returning From Iraq, by Number of Deployments^a

Variable	1 Deployment		2 Deployments		P
	n	%	n	%	
Sex					
Male	593	89.7	600	90.8	.52
Female	68	10.3	61	9.2	
Race/ethnicity ^b					
American Indian or Alaskan native	18	2.7	22	3.3	.52
Asian	31	4.7	28	4.2	.69
Pacific Islander	19	2.9	28	4.2	.18
Black	90	13.6	85	12.9	.69
Hispanic	77	11.6	66	10.0	.33
White	430	65.1	434	65.7	.82
Other	17	2.6	25	3.8	.21
Rank ^c					
E1–E4	285	43.1	164	24.8	<.001
E5–E9	273	41.3	424	64.1	
Officer	87	13.2	57	8.6	
Warrant officer	16	2.4	16	2.4	
Education					
High school graduate or less ^d	213	32.2	236	35.7	.003
Some college but no degree	273	41.3	305	46.1	
Associate's degree	47	7.1	41	6.2	
College graduate (bachelor's degree)	95	14.4	64	9.7	
Postgraduate or professional degree	33	5.0	15	2.3	
Marital status					
Never married	216	37.7	155	23.4	<.001
Married	390	59.0	403	61.0	
Separated	21	3.2	35	5.3	
Divorced	34	5.1	68	10.3	

^aMean (SD) ages were as follows: 1 deployment, 27.89 (6.09) years; 2 deployments, 29.01 (5.91) years; $P < .001$.

^bFor race/ethnic status, soldiers were asked to select all that applied.

^cRank: E1–E4 indicates enlisted rank of Private E-1 (PV1) to Corporal (E-4) or Specialist (E-4). E5–E9 indicates Senior Enlisted Rank of Sergeant (E-5) to Sergeant Major (E-9) or Command Sergeant Major (E-9).

^dThirty-seven subjects reported less than a high school diploma (19 with 1 deployment and 18 with 2 deployments).

9 months later than the median arrival date for soldiers with 1 deployment to Iraq (January 27, 2005).

Mental Health Screening Results

There was a significant association between number of deployments and mental health screening results in the univariate analyses for PTSD-2 (OR = 1.64, $P = .001$) and PTSD-3 (OR = 1.60, $P = .01$; Table 3). There were no differences between the groups in the odds of screening positive for other conditions.

After adjusting for demographic factors, the association between number of deployments and PTSD-2 (OR = 1.72, $P = .001$) and PTSD-3 (OR = 1.77, $P = .003$) remained significant. In addition, some of the demographic factors in the models were associated with the mental health screening results. Older age was associated with decreased odds of screening positive for PTSD-3 (OR = 0.96, $P = .04$) and

Table 2. Combat Exposure for Soldiers With Either 1 or 2 Operation Iraqi Freedom Deployments

Combat Exposure	1 Deployment		2 Deployments	
	n	%	n	%
Wounded or injured	51	7.7	69	10.4
Witnessed killing	186	28.1	183	27.7
Saw dead bodies	343	51.9	338	51.1
Killed others	111	16.8	101	15.3

hazardous alcohol consumption (OR = 0.93, $P = .004$). Women were less likely to screen positive for hazardous alcohol consumption than men (OR = 0.45, $P = .03$). The odds of screening positive for major depression (OR = 0.49, $P = .04$), panic (OR = 0.36, $P = .03$), and other anxiety disorder (OR = 0.60, $P = .03$) was lower for senior enlisted (E-5 to E-9) compared to junior enlisted (E-1 to E-4) soldiers. In addition, officers were less likely to screen positive for panic (OR = 0.05, $P = .04$) and hazardous alcohol consumption (OR = 0.02, $P = .03$) than junior enlisted soldiers. Married soldiers were less likely to screen positive for hazardous alcohol consumption than soldiers who were never married (OR = 0.50, $P = .001$), while soldiers who were separated at the time of the screening were more likely to screen positive for other anxiety disorder (OR = 2.66, $P = .01$) and hazardous alcohol consumption (2.68, $P = .003$). Finally, the odds of screening positive for PTSD-2 (1.46, $P = .03$) and PTSD-3 (OR = 1.53, $P = .049$) were higher for those with some college than for those with a high school education or less.

These analyses were repeated after adding the number of days between screening and departure from theater to the model. The results were unchanged. In addition, although cases with a history of an OEF deployment were excluded from this study, subjects did report a history of other non-OIF/OEF deployments (mean \pm SD = 0.57 \pm 0.87 for those with 1 OIF deployment; 0.94 \pm 1.19 for those with 2 OIF deployments). Again, the results of the logistic regressions remained unchanged after controlling for the number of non-OIF/OEF deployments.

DISCUSSION

The results of this study provide preliminary evidence that multiple deployments to Iraq may be a risk factor for PTSD. The odds of screening positive for PTSD were 60% to 77% higher for soldiers with 2 deployments compared to soldiers with 1 deployment. These results were somewhat unexpected, since the group with 2 deployments was a more mature group that may have represented a more resilient cohort. Soldiers with 2 deployments likely had longer military careers and therefore differed from those with 1 deployment in terms of age, rank, education, and marital status. In addition, soldiers identified with a postdeployment mental health condition that renders them unfit for duty are not deployed again until treatment proves successful. Furthermore, service members who screen positive for

Table 3. Mental Health Screening Results by Number of Iraq Deployments^a

Result	1 Deployment		2 Deployments		Crude OR (95% CI)	Adjusted OR ^b (95% CI)
	No. Screening Positive/n	%	No. Screening Positive/n	%		
Major depression	24/650	3.7	30/651	4.6	1.26 (0.73 to 2.18)	1.52 (0.84 to 2.73)
Other depression	34/650	5.2	40/651	6.1	1.19 (0.74 to 1.90)	1.21 (0.73 to 2.00)
PTSD-2	91/657	13.9	137/653	21.0	1.64** (1.23 to 2.20)	1.72** (1.26 to 2.34)
PTSD-3	56/657	8.6	85/653	13.0	1.60* (1.12 to 2.28)	1.77** (1.21 to 2.59)
Panic	14/657	2.1	17/660	2.6	1.21 (0.59 to 2.48)	1.29 (0.61 to 2.74)
Other anxiety	59/661	8.9	75/660	11.4	1.31 (0.91 to 1.87)	1.31 (0.90 to 1.92)
Hazardous alcohol consumption	80/655	12.2	85/657	12.9	1.07 (0.77 to 1.48)	1.19 (0.82 to 1.70)

^aDenominators differ because subjects did not answer every question. Subjects with missing data did not differ from the rest of the sample in terms of age, sex, race/ethnicity, rank, education, or combat exposure.

^bAdjusted for age, sex, education, racial/ethnic background, rank, and marital status.

**P* < .05.

***P* < .005.

Abbreviations: OR=odds ratio, PTSD-2=results from the Primary Care Posttraumatic Stress Disorder Screen (PC-PTSD) using a cutoff score of 2; PTSD-3=results from the PC-PTSD using a cutoff score of 3.

mental health concerns are more likely to leave military service in the year following a deployment³ and, therefore, may be less likely to deploy a second time. Thus, it is possible that the group with 2 deployments represented a healthier, more resilient group. However, without predeployment screening rates for both groups, conclusions are limited. A longitudinal study of the effects of multiple deployments on mental health would be helpful to clarify these issues.

These findings are generally consistent with a recent internal Army report¹⁴ which found that soldiers deployed to Iraq more than once were more likely to screen positive for a combined measure of acute stress, anxiety, or depression. However, different recruitment procedures, participant characteristics, screening procedures, and outcome measures limit comparability.

The factors contributing to these findings are unknown. The results suggest that when 2 cohorts deploy and experience the same types of combat exposure (as measured in this study), the cohort on their second Iraq deployment is more likely to screen positive for PTSD than the cohort on their first deployment. Since there was no difference on other mental health screening results, we speculate that the mental health risks associated with multiple deployments may be related more to the effects of repeated traumatic experiences (eg, combat exposure) than other cumulative deployment stressors (eg, homefront stressors, difficulties associated with working in an operational environment) that might be expected to be associated with depression or other mental health concerns. Some prior research suggests that repeated traumatic events are associated with increased mental health problems,¹⁷ while other studies have suggested that prior exposure to a stressor may facilitate resilience.³⁷ Dougall et al³⁸ theorized that a traumatic event may produce an inoculating effect for future traumas that are similar in nature to prior traumas, whereas dissimilar events may increase posttraumatic symptoms. While different types of combat exposure are somewhat similar to each other relative to non-combat-related traumatic

events (eg, earthquakes, sexual assault), there is still significant diversity across combat experiences. There was no evidence of an inoculating effect of multiple deployments. However, information about combat exposure during first deployments (among soldiers with 2 deployments) was not available. Thus, the impact of additive combat exposures across multiple deployments remains unknown. Additional research is needed to determine how the etiology of mental health disorders following a second deployment may differ from soldiers deployed to Iraq only once.

In general, positive screening results were more prevalent in single, younger, lower-enlisted soldiers. In addition, men were at significantly greater odds of hazardous alcohol consumption. With the exception of a single education finding, these results were predicted and consistent with prior literature.³⁹

Rates of positive screens for mental health disorders were generally lower than those reported by Hoge and colleagues.⁴ For example, while Hoge et al⁴ reported that 15% of their Army sample screened positive for major depression on the PHQ after deployment to Iraq, we observed a rate of about 4% for our total sample using the same measure and criteria (“broad” definition in the Hoge et al study⁴). However, significant differences between study methods may account for these differences. Hoge and colleagues⁴ study utilized an anonymous survey with a specific infantry division, 3 to 4 months after an 8-month deployment to Iraq in December 2003. Our results were obtained from non-anonymous, standard postdeployment screening efforts for soldiers from a variety of units, 3 to 6 months after deployments (of varying lengths) to Iraq, from September 2005 to April 2007. Many of these factors likely contributed to the differences in the results. For example, since our sample included noncombat units, combat exposure may have been reduced in our sample compared to that of Hoge et al.⁴ In support of this hypothesis, 62% of their sample endorsed responsibility for the death of others (combatants and non-combatants) compared to 16% of our total sample.

In contrast, the rates of mental health concerns that we observed were higher than those reported in a recent study that examined population-based results of Army soldiers and Marines screened within 2 weeks of returning from a deployment to Iraq.³ Utilizing the 2-point cutoff score for the PC-PTSD, the investigators reported a PTSD-positive screen rate of 9.8% in their Iraq sample; this compares to a rate of about 17% in our total sample using the same measure. Both studies included a similar self-report item about whether service members saw dead bodies, and results were similar (52% in the current study compared to 50% in the Hoge et al³ study). There were no other similar combat exposure items shared between the 2 studies to further explore differences between the studies' samples. However, an important difference between the studies was the timing of the screening visit. The Hoge et al³ study was conducted within 2 weeks of returning from deployment, while our data were gathered about 3 to 6 months after deployment. Some research suggests that service members are much more likely to report mental health problems 3 to 4 months after deployment compared to shortly after returning.^{2,40}

The results of the current research should be confirmed in future studies, as the cross-sectional design limits conclusions. In addition, all study subjects were drawn from 1 Army installation with a large active duty population. These soldiers may differ from the broader Army in a number of ways, and the results may not generalize to the rest of the Army. Generalizability is further reduced by the fact that the current study included only regular, active duty soldiers. Furthermore, it is important to emphasize that these results were obtained with self-administered screening instruments; these results do not reflect diagnostic rates.

Although subjects were matched on total types of combat experienced (eg, any exposure to dead bodies), the combat exposure scale did not account for quantity of exposure (eg, number of dead bodies observed). Therefore, it is possible that matched subjects differed in quantity of exposure. In addition, although analyses were adjusted for age, rank, and number of deployments, it is possible that cases with longer military careers were more likely to deploy with PTSD.

The time-frame of the study period may prove important for studying mental health outcomes of multiple deployments. In this study, the median date of arrival in Iraq was 9 months later for those with 2 deployments. As the theater matures and the mission requirements of Operation Iraqi Freedom evolve, the nature of the stressors that soldiers experience may change. For example, a recent Army study suggested that, although combat exposure rates remained high overall in 2007, there may have been a relative decline in combat exposure compared to 2006.¹⁴ Therefore, rates examined during 1 time frame of the conflict may not generalize to other periods. In addition, it is possible that other environmental factors (eg, access to mental health resources, telecommunications) may have differed by date, which may have impacted the results. However, since the earliest

screening date included in this study was September 2005 (2 1/2 years after the start of the War), most soldiers probably benefited from the development of resources in Iraq, and these factors may have been minimized.

The importance of understanding the mental health effects of multiple deployments is likely to grow as the number of service members with 2 or more deployments increases. The results of this study provide preliminary evidence that the risk of PTSD may increase following a second deployment to Iraq. As the number of service members deployed for second tours increases, these findings may have significant implications for the demand on mental health treatment resources.

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