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Combat Duty in Iraq and Afghanistan, Mental Health Problems, and Barriers to Care

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ABSTRACT

BACKGROUND

The current combat operations in Iraq and Afghanistan have involved U.S. military personnel in major ground combat and hazardous security duty. Studies are needed to systematically assess the mental health of members of the armed services who have participated in these operations and to inform policy with regard to the optimal delivery of mental health care to returning veterans.

METHODS

We studied members of four U.S. combat infantry units (three Army units and one Marine Corps unit) using an anonymous survey that was administered to the subjects either before their deployment to Iraq (n=2530) or three to four months after their return from combat duty in Iraq or Afghanistan (n=3671). The outcomes included major depression, generalized anxiety, and post-traumatic stress disorder (PTSD), which were evaluated on the basis of standardized, self-administered screening instruments.

RESULTS

Exposure to combat was significantly greater among those who were deployed to Iraq than among those deployed to Afghanistan. The percentage of study subjects whose responses met the screening criteria for major depression, generalized anxiety, or PTSD was significantly higher after duty in Iraq (15.6 to 17.1 percent) than after duty in Afghanistan (11.2 percent) or before deployment to Iraq (9.3 percent); the largest difference was in the rate of PTSD. Of those whose responses were positive for a mental disorder, only 23 to 40 percent sought mental health care. Those whose responses were positive for a mental disorder were twice as likely as those whose responses were negative to report concern about possible stigmatization and other barriers to seeking mental health care.

CONCLUSIONS

This study provides an initial look at the mental health of members of the Army and the Marine Corps who were involved in combat operations in Iraq and Afghanistan. Our findings indicate that among the study groups there was a significant risk of mental health problems and that the subjects reported important barriers to receiving mental health services, particularly the perception of stigma among those most in need of such care.

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THE RECENT MILITARY OPERATIONS IN Iraq and Afghanistan, which have involved the first sustained ground combat undertaken by the United States since the war in Vietnam, raise important questions about the effect of the experience on the mental health of members of the military services who have been deployed there. Research conducted after other military conflicts has shown that deployment stressors and exposure to combat result in considerable risks of mental health problems, including post-traumatic stress disorder (PTSD), major depression, substance abuse, impairment in social functioning and in the ability to work, and the increased use of health care services.[1-8] One study that was conducted just before the military operations in Iraq and Afghanistan began found that at least 6 percent of all U.S. military service members on active duty receive treatment for a mental disorder each year.[9] Given the ongoing military operations in Iraq and Afghanistan, mental disorders are likely to remain an important health care concern among those serving there.

Many gaps exist in the understanding of the full psychosocial effect of combat. The all-volunteer force deployed to Iraq and Afghanistan and the type of warfare conducted in these regions are very different from those involved in past wars, differences that highlight the need for studies of members of the armed services who are involved in the current operations. Most studies that have examined the effects of combat on mental health were conducted among veterans years after their military service had ended.[1-8] A problem in the methods of such studies is the long recall period after exposure to combat.[10] Very few studies have examined a broad range of mental health outcomes near to the time of subjects' deployment.

Little of the existing research is useful in guiding policy with regard to how best to promote access to and the delivery of mental health care to members of the armed services. Although screening for mental health problems is now routine both before and after deployment[11] and is encouraged in primary care settings,[12] we are not aware of any studies that have assessed the use of mental health care, the perceived need for such care, and the perceived barriers to treatment among members of the military services before or after combat deployment.

We studied the prevalence of mental health problems among members of the U.S. armed services who were recruited from comparable combat units before or after their deployment to Iraq or Afghanistan. We identified the proportion of service members with mental health concerns who were not receiving care and the barriers they perceived to accessing and receiving such care.

METHODS

STUDY GROUPS

We summarized data from the first, cross-sectional phase of a longitudinal study of the effect of combat on the mental health of the soldiers and Marines deployed in Operation Iraqi Freedom and in Operation Enduring Freedom in Afghanistan. Three comparable U.S. Army units were studied with the use of an anonymous survey administered either before deployment to Iraq or after their return from Iraq or Afghanistan. Although no data from before deployment were available for the Marines in the study, data were collected from a Marine Corps unit after its return from Iraq that provided a basis for comparison with data obtained from Army soldiers after their return from Iraq.

The study groups included 2530 soldiers from an Army infantry brigade of the 82nd Airborne Division, whose responses to the survey were obtained in January 2003, one week before a year-long deployment to Iraq; 1962 soldiers from an Army infantry brigade of the 82nd Airborne Division, whose responses were obtained in March 2003, after the soldiers' return from a six-month deployment to Afghanistan; 894 soldiers from an Army infantry brigade of the 3rd Infantry Division, whose responses were obtained in December 2003, after their return from an eight-month deployment to Iraq; and 815 Marines from two battalions under the command of the 1st Marine Expeditionary Force, whose responses were obtained in October or November 2003, after a six-month deployment to Iraq. The 3rd Infantry Division and the Marine battalions had spearheaded early ground-combat operations in Iraq, in March through May 2003. All the units whose members responded to the survey were also involved in hazardous security duties. The questionnaires administered to soldiers and Marines after deployment to Iraq or Afghanistan were administered three to four months after their return to the United States. This interval allowed time in which the soldiers completed leave, made the transition back to garrison work duties, and had the opportunity to seek medical or mental health treatment, if needed.

RECRUITMENT AND REPRESENTATIVENESS OF THE SAMPLE

Unit leaders assembled the soldiers and Marines near their workplaces at convenient times, and the study investigators then gave a short recruitment briefing and obtained written informed consent on forms that included statements about the purpose of the survey, the voluntary nature of participation, and the methods used to ensure participants' anonymity. Overall, 58 percent of the soldiers and Marines from the selected units were available to attend the recruitment briefings (79 percent of the soldiers before deployment, 58 percent of the soldiers after deployment in Operation Enduring Freedom in Afghanistan, 34 percent of the soldiers after deployment in Operation Iraqi Freedom, and 65 percent of the Marines after deployment in Operation Iraqi Freedom). Most of those who did not attend the briefings were not available because of their rigorous work and training schedules (e.g., night training and post security).

A response was defined as completion of any part of the survey. The response rate among the soldiers and Marines who were briefed was 98 percent for the four samples combined. The rates of missing values for individual items in the survey were generally less than 15 percent; 2 percent of participants did not complete the PTSD measures, 5 percent did not complete the depression and anxiety measures, and 7 to 8 percent did not complete the items related to the use of alcohol. The high response rate was probably owing to the anonymous nature of the survey and to the fact that participants were given time by their units to complete the 45-minute survey. The study was conducted under a protocol approved by the institutional review board of the Walter Reed Army Institute of Research.

To assess whether or not our sample was representative, we compared the demographic characteristics of respondents with those of all active-duty Army and Marine personnel deployed to Operation Iraqi Freedom and Operation Enduring Freedom, using the Defense Medical Surveillance System.[13]

SURVEY AND MENTAL HEALTH OUTCOMES

The study outcomes were focused on current symptoms (i.e., those occurring in the past month) of a major depressive disorder, a generalized anxiety disorder, and PTSD. We used two case definitions for each disorder, a broad screening definition that followed current psychiatric diagnostic criteria[14] but did not include criteria for functional impairment or for severity, and a strict (conservative) screening definition that required a self-report of substantial functional impairment or a large number of symptoms. Major depression and generalized anxiety were measured with the use of the patient health questionnaire developed by Spitzer et al.[15-17] For the strict definition to be met, there also had to be evidence of impairment in work, at home, or in interpersonal functioning that was categorized as at the "very difficult" level as measured by the patient health questionnaire. The generalized anxiety measure was modified slightly to avoid redundancy; items that pertained to concentration, fatigue, and sleep disturbance were drawn from the depression measure.

The presence or absence of PTSD was evaluated with the use of the 17-item National Center for PTSD Checklist of the Department of Veterans Affairs.[4,8,18,19] Symptoms were related to any stressful experience (in the wording of the "specific stressor" version of the checklist), so that the outcome would be independent of predictors (i.e., before or after deployment). Results were scored as positive if subjects reported at least one intrusion symptom, three avoidance symptoms, and two hyperarousal symptoms[14] that were categorized as at the moderate level, according to the PTSD checklist. For the strict definition to be met, the total score also had to be at least 50 on a scale of 17 to 85 (with a higher number indicating a greater number of symptoms or greater severity), which is a well-established cutoff.[4,8,18,19] Misuse of alcohol was measured with the use of a two-question screening instrument.[20]

In addition to these measures, on the survey participants were asked whether they were currently experiencing stress, emotional problems, problems related to the use of alcohol, or family problems and, if so, whether the level of these problems was mild, moderate, or severe; the participants were then asked whether they were interested in receiving help for these problems. Subjects were also asked about their use of professional mental health services in the past month or the past year and about perceived barriers to mental health treatment, particularly stigmatization as a result of receiving such treatment.[21] Combat experiences were modified from previous scales.[22]

QUALITY-CONTROL PROCEDURES AND ANALYSIS

Responses to the survey were scanned with the use of ScanTools software (Pearson NCS). Quality-

control procedures identified scanning errors in no more than 0.38 percent of the fields (range, 0.01 to 0.38 percent). SPSS software (version 12.0) was used to conduct the analyses, including multiple logistic regression that was used to control for differences in demographic characteristics of members of study groups before and after deployment.[23,24]

RESULTS

The demographic characteristics of participants from the three Army units were similar. The Marines in the study were somewhat younger than the soldiers in the study and less likely to be married. The demographic characteristics of all the participants in the survey samples were very similar to those of the general, deployed, active-duty infantry population, except that officers were undersampled, which resulted in slightly lower age and rank distributions (Table 1). Data for the reference populations were obtained from the Defense Medical Surveillance System with the use of available rosters of Army and Marine personnel deployed to Iraq or Afghanistan in 2003 (Table 1).

Among the 1709 soldiers and Marines who had returned from Iraq the reported rates of combat experiences and frequency of contact with the enemy were much higher than those reported by soldiers who had returned from Afghanistan (Table 2). Only 31 percent of soldiers deployed to Afghanistan reported having engaged in a firefight, as compared with 71 to 86 percent of soldiers and Marines who had been deployed to Iraq. Among those who had been in a firefight, the median number of firefights during deployment was 2 (interquartile range, 1 to 3) among those in Afghanistan, as compared with 5 (interquartile range, 2 to 13; $P<0.001$ by analysis of variance) among soldiers deployed to Iraq and 5 (interquartile range, 3 to 10; $P<0.001$ by analysis of variance) among Marines deployed to Iraq.

Soldiers and Marines who had returned from Iraq were significantly more likely to report that they were currently experiencing a mental health problem, to express interest in receiving help, and to use mental health services than were soldiers returning from Afghanistan or those surveyed before deployment (Table 3). Rates of PTSD were significantly higher after combat duty in Iraq than before deployment, with similar odds ratios for the Army and Marine samples (Table 3). Significant associations were observed for major depression and the misuse of alcohol. Most of these associations remained significant after control for demographic factors with the use of multiple logistic regression (Table 3). When the prevalence rates for any mental disorder were adjusted to match the distribution of officers and enlisted personnel in the reference populations, the result was less than a 10 percent decrease (range, 3.5 to 9.4 percent) in the rates shown in Table 3 according to both the broad and the strict definitions (data not shown).

For all groups responding after deployment, there was a strong reported relation between combat experiences, such as being shot at, handling dead bodies, knowing someone who was killed, or killing enemy combatants, and the prevalence of PTSD. For example, among soldiers and Marines who had been deployed to Iraq, the prevalence of PTSD (according to the strict definition) increased in a linear manner with the number of firefights during deployment: 4.5 percent for no firefights, 9.3 percent for one to two firefights, 12.7 percent for three to five firefights, and 19.3 percent for more than five firefights (chi-square for linear trend, 49.44; $P<0.001$). Rates for those who had been deployed to Afghanistan were 4.5 percent, 8.2 percent, 8.3 percent, and 18.9 percent, respectively (chi-square for linear trend, 31.35; $P<0.001$). The percentage of participants who had been deployed to Iraq who reported being wounded or injured was 11.6 percent as compared with only 4.6 percent for those who had been deployed to Afghanistan. The rates of PTSD were significantly associated with having been wounded or injured (odds ratio for those deployed to Iraq, 3.27; 95 percent confidence interval, 2.28 to 4.67; odds ratio for those deployed to Afghanistan, 2.49; 95 percent confidence interval, 1.35 to 4.40).

Of those whose responses met the screening criteria for a mental disorder according to the strict case definition, only 38 to 45 percent indicated an interest in receiving help, and only 23 to 40 percent reported having received professional help in the past year (Table 4). Those whose responses met these screening criteria were generally about two times as likely as those whose responses did not to report concern about being stigmatized and about other barriers to accessing and receiving mental health services (Table 5).

DISCUSSION

We investigated mental health outcomes among soldiers and Marines who had taken part in the ground-combat operations in Iraq and Afghani-

Table 1. Demographic Characteristics of Study Groups of Soldiers and Marines as Compared with Reference Groups.*

Characteristic	Army Study Groups			Marine Study Group	Army Reference Group (N=61,742)	Marine Reference Group (N=20,194)
	Before Deployment to Iraq (N=2530)	After Deployment to Afghanistan (N=1962)	After Deployment to Iraq (N=894)	After Deployment to Iraq (N=815)		
			number (percent)			
Age						
18–24 yr	1647 (66)	1226 (63)	528 (59)	652 (80)	32,840 (53)	13,824 (69)
25–29 yr	496 (20)	387 (20)	206 (23)	114 (14)	13,737 (22)	3,174 (16)
30–39 yr	336 (13)	316 (16)	147 (16)	41 (5)	12,960 (21)	2,703 (13)
40 yr or older	34 (1)	28 (1)	13 (2)	4 (1)	2,205 (4)	493 (2)
Sex						
Male	2489 (99)	1934 (99)	879 (98)	815 (100)	61,201 (99)	20,090 (99.5)
Female	26 (1)	23 (1)	14 (2)		541 (1)	104 (0.5)
Race or ethnic group						
White	1749 (70)	1339 (69)	531 (60)	544 (68)	44,365 (72)	15,344 (76)
Black	208 (8)	198 (10)	185 (21)	53 (7)	7,904 (13)	1,213 (6)
Hispanic	331 (13)	254 (13)	102 (12)	141 (18)	6,140 (10)	2,642 (13)
Other	195 (8)	141 (7)	67 (8)	63 (8)	3,262 (5)	867 (4)
Education						
High-school graduate or less	1955 (78)	1514 (78)	726 (82)	728 (89)	48,561 (79)	16,892 (84)
Some college or other	202 (8)	153 (8)	73 (8)	29 (4)	3,260 (5)	346 (2)
College graduate	339 (14)	277 (14)	85 (10)	54 (7)	8,838 (14)	2,945 (15)
Military grade						
Enlisted personnel†						
E1–E4	1585 (63)	1170 (60)	613 (69)	601 (84)	33,823 (55)	13,744 (68)
E5–E6	614 (24)	524 (27)	228 (26)	77 (11)	14,813 (24)	2,850 (14)
E7–E9	116 (5)	91 (5)	23 (3)	8 (1)	3,819 (6)	607 (3)
Officer	200 (8)	168 (8)	30 (3)	26 (4)	9,287 (15)	2,993 (15)
Marital status						
Single	1142 (50)	908 (52)	355 (46)	455 (63)	32,636 (53)	12,332 (61)
Married	936 (41)	685 (39)	338 (43)	204 (28)	27,582 (45)	7,499 (37)
Other	199 (9)	168 (9)	85 (11)	65 (9)	1,485 (2)	363 (2)

* Data exclude missing values, because not all respondents answered every question. Percentages may not sum to 100 because of rounding. Data for the reference groups were obtained from the Defense Medical Surveillance System's deployment rosters of Army and Marine personnel deployed in Operation Iraqi Freedom and in Afghanistan in 2003. The total number of persons on these rosters was 315,999, of whom 229,034 (72 percent) were active-component personnel; the remaining 86,965 were members of the Reserve and National Guard; 97,906 (31 percent) had a designation of a combat-arms occupation. Of the 229,034 active-component service members, 81,936 (36 percent) had combat-arms occupations, including 61,742 soldiers and 20,194 Marines in the reference groups.

† Higher numbers indicate higher grades.

stan. Respondents to our survey who had been deployed to Iraq reported a very high level of combat experiences, with more than 90 percent of them reporting being shot at and a high percentage reporting handling dead bodies, knowing someone who was injured or killed, or killing an enemy combatant (Table 2). Close calls, such as having been saved from being wounded by wearing body armor, were not infrequent. Soldiers who served in Afghanistan reported lower but still substantial rates of such experiences in combat.

The percentage of study subjects whose responses met the screening criteria for major depression, PTSD, or alcohol misuse was significantly higher among soldiers after deployment than before deployment, particularly with regard to PTSD. The linear relationship between the prevalence of PTSD and the number of firefights in which a soldier had been engaged was remarkably similar among soldiers returning from Iraq and Afghanistan, suggesting that differences in the prevalence according to location were largely a function of the greater frequency and intensity of combat in Iraq. The association between injury and the prevalence of PTSD supports the results of previous studies.[25]

These findings can be generalized to ground-

Table 2. Combat Experiences Reported by Members of the U.S. Army and Marine Corps after Deployment to Iraq or Afghanistan.*

Experience	Army Groups		Marine Group
	Afghanistan (N=1962)	Iraq (N=894)	Iraq (N=815)
	number/total number (percent)		
Being attacked or ambushed	1139/1961 (58)	789/883 (89)	764/805 (95)
Receiving incoming artillery, rocket, or mortar fire	1648/1960 (84)	753/872 (86)	740/802 (92)
Being shot at or receiving small-arms fire	1302/1962 (66)	826/886 (93)	779/805 (97)
Shooting or directing fire at the enemy	534/1961 (27)	672/879 (77)	692/800 (87)
Being responsible for the death of an enemy combatant	229/1961 (12)	414/871 (48)	511/789 (65)
Being responsible for the death of a noncombatant	17/1961 (1)	116/861 (14)	219/794 (28)
Seeing dead bodies or human remains	771/1958 (39)	832/879 (95)	759/805 (94)
Handling or uncovering human remains	229/1961 (12)	443/881 (50)	455/800 (57)
Seeing dead or seriously injured Americans	591/1961 (30)	572/882 (65)	604/803 (75)
Knowing someone seriously injured or killed	850/1962 (43)	751/878 (86)	693/797 (87)
Participating in demining operations	314/1962 (16)	329/867 (38)	270/787 (34)
Seeing ill or injured women or children whom you were unable to help	907/1961 (46)	604/878 (69)	665/805 (83)
Being wounded or injured	90/1961 (5)	119/870 (14)	75/803 (9)
Had a close call, was shot or hit, but protective gear saved you	—†	67/879 (8)	77/805 (10)
Had a buddy shot or hit who was near you	—†	192/880 (22)	208/797 (26)
Clearing or searching homes or buildings	1108/1961 (57)	705/884 (80)	695/805 (86)
Engaging in hand-to-hand combat	51/1961 (3)	189/876 (22)	75/800 (9)
Saved the life of a soldier or civilian	125/1961 (6)	183/859 (21)	150/789 (19)

* Data exclude missing values, because not all respondents answered every question. Combat experiences are worded as in the survey.
† The question was not included in this survey.

combat units, which are estimated to represent about a quarter of all Army and Marine personnel participating in Operation Iraqi Freedom and Operation Enduring Freedom in Afghanistan (when members of the Reserve and the National Guard are included) and nearly 40 percent of all active-duty personnel (when Reservists and members of the National Guard are not included). The demographic characteristics of the subjects in our samples closely mirrored the demographic characteristics of this population. The somewhat lower proportion of officers had a minimal effect on the prevalence rates, and potential differences in demographic factors among the four study groups were controlled for in our analysis with the use of logistic regression.

One demonstration of the internal validity of our findings was the observation of similar prevalence rates for combat experiences and mental health outcomes among the subjects in the Army and the Marine Corps who had returned from deployment to Iraq, despite the different demographic characteristics of members of these units and their different levels of availability for recruitment into the study.

The cross-sectional design involving different units that was used in our study is not as strong as a longitudinal design. However, the comparability of the Army samples and the similarity in outcomes among subjects in the Army and Marine units surveyed after deployment to Iraq should generate confidence in the cross-sectional approach. Another limitation of our study is the potential selection bias resulting from the enrollment procedures, which were influenced by the practical realities that resulted from working with operational units. Although work schedules affected the availability of soldiers to take part in the survey, the effect is not likely to have biased our results. However, the selection procedures did not permit the enrollment of persons who had been severely wounded or those who may have been removed from the units for oth-

Table 3. Perceived Mental Health Problems and Percentage of Subjects Who Met the Screening Criteria for Major Depression, Generalized Anxiety, Post-Traumatic Stress Disorder, and Alcohol Misuse.*

Mental Health Problem	Army Study Groups					Marine Study Group	
	Before Deployment to Iraq (N=2530)	After Deployment to Afghanistan (N=1962)		After Deployment to Iraq (N=894)		After Deployment to Iraq (N=815)	
	no./total no. (%)	*no./total no. (%)*	*OR (95% CI)*	*no./total no. (%)*	*OR (95% CI)*	*no./total no. (%)*	*OR (95% CI)*
Perceived moderate or severe problem	323/2261 (14.3)	303/1769 (17.1)†‡		153/784 (19.5)†‡		123/720 (17.1)	
Currently interested in receiving professional help	211/2243 (9.4)	180/1769 (10.2)		131/786 (16.7)†‡		106/706 (15.0)†‡	
Received professional help in the past month§	108/2280 (4.7)	118/1780 (6.6)†‡		91/796 (11.4)†‡		70/742 (9.4)†‡	
Definition of mental disorder							
Broad definition							
Depression according to PHQ	275/2418 (11.4)	267/1885 (14.2)	1.29 (1.07–1.54)†‡	128/840 (15.2)	1.40 (1.12–1.76)†‡	114/775 (14.7)	1.34 (1.06–1.70)¶
Anxiety according to PHQ	375/2419 (15.5)	324/1886 (17.2)	1.13 (0.96–1.33)	147/839 (17.5)	1.16 (0.94–1.43)	122/776 (15.7)	1.02 (0.81–1.27)
PTSD according to PCL	226/2414 (9.4)	224/1956 (11.5)	1.25 (1.03–1.52)¶	159/881 (18.0)	2.13 (1.71–2.66)†‡	161/811 (19.9)	2.40 (1.92–2.99)†‡
Any of above	522/2500 (20.9)	479/1958 (24.5)	1.23 (1.07–1.41)†‡	246/882 (27.9)	1.47 (1.23–1.75)†‡	237/813 (29.2)	1.56 (1.30–1.87)†
Strict definition							
Depression according to PHQ	128/2418 (5.3)	130/1885 (6.9)	1.33 (1.03–1.71)‡¶	66/840 (7.9)	1.53 (1.12–2.08)†‡	55/775 (7.1)	1.37 (0.99–1.90)
Anxiety according to PHQ	155/2419 (6.4)	140/1886 (7.4)	1.17 (0.92–1.48)	66/839 (7.9)	1.25 (0.92–1.68)	51/776 (6.6)	1.03 (0.74–1.43)
PTSD according to PCL	120/2414 (5.0)	121/1956 (6.2)	1.26 (0.97–1.64)	114/881 (12.9)	2.84 (2.17–3.72)†‡	99/811 (12.2)	2.66 (2.01–3.51)†‡
Any of above	233/2500 (9.3)	220/1958 (11.2)	1.23 (1.01–1.50)¶	151/882 (17.1)	2.01 (1.61–2.51)†‡	127/813 (15.6)	1.80 (1.43–2.27)†‡
Alcohol misuse							
Have you used alcohol more than you meant to?	405/2358 (17.2)	452/1844 (24.5)	1.57 (1.35–1.82)†‡	198/819 (24.2)	1.54 (1.27–1.86)†‡	268/756 (35.4)	2.65 (2.20–3.18)†‡
Have you felt you wanted or needed to cut down on your drinking?	289/2313 (12.5)	331/1821 (18.2)	1.56 (1.31–1.85)†‡	168/815 (20.6)	1.82 (1.47–2.24)†‡	219/744 (29.4)	2.92 (2.39–3.57)†‡

* Each study group who responded after deployment was compared with the group that responded before deployment, with the use of odds ratios (with 95 percent confidence intervals) and chi-square testing. Data exclude missing values, because not all respondents answered every question. OR denotes odds ratio, CI confidence interval, PHQ patient health questionnaire, PTSD post-traumatic stress disorder, and PCL the National Center for Post-Traumatic Stress Disorder Checklist.

† P<0.01 for the comparison of groups responding after deployment with the group responding before deployment, calculated with the use of the chi-square test.

‡ The result remained significant after multiple logistic regression was used to control for age, rank, educational level, marital status, and race or ethnic group.

§ Professional help was defined as help from a mental health professional, a general medical doctor, or a chaplain or other member of the clergy, in either a military or civilian treatment setting.

¶ P<0.05 for the comparison of groups responding after deployment with the group responding before deployment, calculated with the use of the chi-square test.

Table 4. Perceived Need for and Use of Mental Health Services among Soldiers and Marines Whose Survey Responses Met the Screening Criteria for Major Depression, Generalized Anxiety, or Post-Traumatic Stress Disorder.*

Outcome	Army Study Groups			Marine Study Group
	Before Deployment to Iraq (N=233)	After Deployment to Afghanistan (N=220)	After Deployment to Iraq (N=151)	After Deployment to Iraq (N=127)
	number/total number (percent)			
Need				
Acknowledged a problem	184/215 (86)	156/192 (81)	104/133 (78)	91/106 (86)
Interested in receiving help	85/212 (40)	75/196 (38)	58/134 (43)	47/105 (45)
Received professional help†				
In past year				
Overall (from any professional)	61/222 (28)	46/198 (23)	56/140 (40)	33/113 (29)
From a mental health professional	33/222 (15)	26/198 (13)	37/138 (27)	24/112 (21)
In past month				
Overall (from any professional)	39/218 (18)	34/196 (17)	44/136 (32)	23/112 (21)
From a mental health professional	24/218 (11)	25/196 (13)	29/136 (21)	16/111 (14)

* Data exclude missing values, because not all respondents answered every question.
† Professional help was defined as help from a mental health professional, a general medical doctor, or a chaplain or other member of the clergy, in either a military or civilian treatment setting.

er reasons, such as misconduct. Thus, our estimates of the prevalence of mental disorders are conservative, reflecting the prevalence among working, nondisabled combat personnel. The period immediately before a long combat deployment may not be the best time at which to measure baseline levels of distress. The magnitude of the differences between the responses before and after deployment is particularly striking, given the likelihood that the group responding before deployment was already experiencing levels of stress that were higher than normal.

The survey instruments used to screen for mental disorders in this study have been validated primarily in the settings of primary care and in clinical populations. The results therefore do not represent definitive diagnoses of persons in nonclinical populations such as our military samples. However, requiring evidence of functional impairment or a high number of symptoms, as we did, according to the strict case definitions, increases the specificity and positive predictive value of the survey measures.[26,27] This conservative approach suggested that as many as 9 percent of soldiers may be at risk for mental disorders before combat deployment, and as many as 11 to 17 percent may be at risk for such disorders three to four months after their return from combat deployment.

Although there are few published studies of the rates of PTSD among military personnel soon after their return from combat duty, studies of veterans conducted years after their service ended have shown a prevalence of current PTSD of 15 percent among Vietnam veterans[28] and 2 to 10 percent among veterans of the first Gulf War.[4,8] Rates of PTSD among the general adult population in the United States are 3 to 4 percent,[26] which are not dissimilar to the baseline rate of 5 percent observed in the sample of soldiers responding to the survey before deployment. Research has shown that the majority of persons in whom PTSD develops meet the criteria for the diagnosis of this disorder within the first three months after the traumatic event.[29] In our study, administering the surveys three to four months after the subjects had returned from deployment and at least six months after the heaviest combat operations was probably optimal for investigating the long-term risk of mental health problems associated with combat. We are continuing to examine this risk in repeated cross-sectional and longitudinal assessments involving the same units.

Our findings indicate that a small percentage of soldiers and Marines whose responses met the screening criteria for a mental disorder reported that they had received help from any mental health professional, a finding that parallels the results of civilian studies.[30-32] In the military, there are unique factors that contribute to resistance to seeking such help, particularly concern about how a soldier will be perceived by peers and by the leadership. Concern about stigma was disproportionately greatest among those most in need of help from mental health services. Soldiers and Marines whose responses were scored as positive for a mental disor-

Table 5. Perceived Barriers to Seeking Mental Health Services among All Study Participants (Soldiers and Marines).*

Perceived Barrier	Respondents Who Met Screening Criteria for a Mental Disorder (N=731)	Respondents Who Did Not Meet Screening Criteria for a Mental Disorder (N=5422)
	no./total no. (%)	
I don't trust mental health professionals.	241/641 (38)	813/4820 (17)
I don't know where to get help.	143/639 (22)	303/4780 (6)
I don't have adequate transportation.	117/638 (18)	279/4770 (6)
It is difficult to schedule an appointment.	288/638 (45)	789/4748 (17)
There would be difficulty getting time off work for treatment.	354/643 (55)	1061/4743 (22)
Mental health care costs too much money.	159/638 (25)	456/4736 (10)
It would be too embarrassing.	260/641 (41)	852/4752 (18)
It would harm my career.	319/640 (50)	1134/4738 (24)
Members of my unit might have less confidence in me.	377/642 (59)	1472/4763 (31)
My unit leadership might treat me differently.	403/637 (63)	1562/4744 (33)
My leaders would blame me for the problem.	328/642 (51)	928/4769 (20)
I would be seen as weak.	413/640 (65)	1486/4732 (31)
Mental health care doesn't work.	158/638 (25)	444/4748 (9)

* Data exclude missing values, because not all respondents answered every question. Respondents were asked to rate "each of the possible concerns that might affect your decision to receive mental health counseling or services if you ever had a problem." Perceived barriers are worded as on the survey. The five possible responses ranged from "strongly disagree" to "strongly agree," with "agree" and "strongly agree" combined as a positive response.

der were twice as likely as those whose responses were scored as negative to show concern about being stigmatized and about other barriers to mental health care.

This finding has immediate public health implications. Efforts to address the problem of stigma and other barriers to seeking mental health care in the military should take into consideration outreach, education, and changes in the models of health care delivery, such as increases in the allocation of mental health services in primary care clinics and in the provision of confidential counseling by means of employee-assistance programs. Screening for major depression is becoming routine in military primary care settings,[12] but our study suggests that it should be expanded to include screening for PTSD. Many of these considerations are being addressed in new military programs.[33] Reducing the perception of stigma and the barriers to care among military personnel is a priority for research and a priority for the policymakers, clinicians, and leaders who are involved in providing care to those who have served in the armed forces.

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