

Combat and Peacekeeping Operations in Relation to Prevalence of Mental Disorders and Perceived Need for Mental Health Care

Findings From a Large Representative Sample of Military Personnel

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Context: Although military personnel are trained for combat and peacekeeping operations, accumulating evidence indicates that deployment-related exposure to traumatic events is associated with mental health problems and mental health service use.

Objective: To examine the relationships between combat and peacekeeping operations and the prevalence of mental disorders, self-perceived need for mental health care, mental health service use, and suicidality.

Design: Cross-sectional, population-based survey.

Setting: Canadian military.

Participants: A total of 8441 currently active military personnel (aged 16-54 years).

Main Outcome Measures: The *DSM-IV* mental disorders (major depressive disorder, posttraumatic stress disorder, generalized anxiety disorder, panic disorder, social phobia, and alcohol dependence) were assessed using the World Mental Health version of the World Health Organization Composite International Diagnostic Interview, a fully structured lay-administered psychiatric interview. The survey included validated measures of self-perceived need for mental health treatment, mental health

service use, and suicidal ideation. Lifetime exposure to peacekeeping and combat operations and witnessing atrocities or massacres (ie, mutilated bodies or mass killings) were assessed.

Results: The prevalences of any past-year mental disorder assessed in the survey and self-perceived need for care were 14.9% and 23.2%, respectively. Most individuals meeting the criteria for a mental disorder diagnosis did not use any mental health services. Deployment to combat operations and witnessing atrocities were associated with increased prevalence of mental disorders and perceived need for care. After adjusting for the effects of exposure to combat and witnessing atrocities, deployment to peacekeeping operations was not associated with increased prevalence of mental disorders.

Conclusions: This is the first study to use a representative sample of active military personnel to examine the relationship between deployment-related experiences and mental health problems. It provides evidence of a positive association between combat exposure and witnessing atrocities and mental disorders and self-perceived need for treatment.

Arch Gen Psychiatry. 2007;64(7):843-852

MILITARY PERSONNEL ARE exposed to high rates of traumatic events during participation in combat and peacekeeping operations.¹⁻¹¹ During the past 2 decades, evidence has suggested that deployment to combat operations is associated with increased psychological distress and decreased health-related quality of life.^{1,6-15} In a well-designed study, Dohrenwend et al¹² demonstrated a dose-response relationship between the amount of combat exposure and mental disorders in Vietnam veterans. Similarly, most US and UK studies^{4,9,16-18} of recent com-

bat operations in Iraq and Afghanistan have shown a relationship between deployment and mental health problems. There has also been concern about the negative psychological impact (ie, increased self-reported distress and suicidal behavior) of peacekeeping operations.¹⁹⁻³⁴ Many of these data have been gleaned from recent peacekeeping operations where there has been significant combat and ethnic cleansing (eg, Rwanda³⁵ and Somalia^{6,25,36}). However, several studies^{31,37} have not demonstrated an association between deployment to peacekeeping operations and psychological distress. It remains unclear whether participation in peacekeep-

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ing operations has a unique impact on psychological distress above and beyond that related to exposure to combat operations.

There has also been limited data from military samples on the prevalence of mental health service use and self-reported barriers to service use. Similar to findings in general population samples,³⁸⁻⁴⁰ a US military sample^{4,9} demonstrated that most soldiers who met the screening criteria for a mental disorder had not received any mental health services. Also, military personnel were more likely to report "attitudinal barriers" (eg, "I would be seen as weak" and "my unit leadership might treat me differently") to service use rather than "structural barriers" (eg, "mental health care costs too much money").⁹ There is also emerging evidence of a dose-response relationship between exposure to traumatic events during deployment and mental health service use. The US military personnel returning from Iraq were much more likely to report exposure to deployment-related traumatic events and to use mental health services after deployment than were soldiers returning from Afghanistan.^{4,9} To what degree these findings from US military samples are generalizable to other military samples with differing health care systems remains to be determined.

There are limitations to these previous studies that must be considered in their interpretation. First, most previous studies used treatment-seeking samples or random samples from specific deployments such that the findings may not be generalizable to the whole population of active military personnel. Second, all previous large sample surveys of military personnel used self-report assessments of mental disorders, which are less reliable than interview-based assessments.⁴¹ Third, most previous studies focused specifically on a few mental disorders, usually depression, posttraumatic stress disorder (PTSD), and alcohol abuse.⁴ Results of recent studies suggest that deployment may be associated with several other psychiatric disorders (eg, generalized anxiety disorder and panic disorder),⁴² suicidal ideation,³² adjustment disorders,⁴³ and family conflict.² Fourth, most studies focused on the prevalence of mental disorders (based on self-reported symptoms) as a proxy measure of need for mental health services. Based on numerous cross-national general population surveys⁴⁴⁻⁵⁰ showing that there are not close relationships among the presence of a *DSM* diagnosis, self-perceived need for mental health treatment, and mental health service use, experts in psychiatric epidemiology have suggested the importance of using multiple methods for assessing population-level need for mental health services. These methods include standardized interview-based assessment of mental disorders and systematic elicitation of respondent's perceptions of need for mental health treatment. Finally, there is little information on mental health service use and barriers to care in an active military sample.

The present study addressed these limitations by using the Canadian Community Health Survey Cycle 1.2 Canadian Forces Supplement (CCHS-CFS), a landmark survey that provided the first comprehensive examination of mental disorders, health, and well-being in Canadian military personnel. To our knowledge, the CCHS-CFS is the first military mental health survey in the world to

use a multistage sampling framework to acquire a sample that is representative of all active Canadian military personnel. Further strengths of the CCHS-CFS were its large sample size (>8000 active military personnel) and the use of a state-of-the-art diagnostic interview (the Composite International Diagnostic Interview [CIDI])^{51,52} to examine the prevalence of several common mental disorders, in conjunction with the validated and reliable Perceived Need for Care Questionnaire (PNCQ). The PNCQ has shown acceptable validity and reliability and has been used successfully to assess self-reported need for treatment in clinical samples and in the Australian National Mental Health Survey.⁴⁴⁻⁴⁶

The present study has 2 specific aims: (1) to examine the prevalence of mental disorders (including suicidality) and perceived need for mental health care in a large representative military sample and (2) to examine the relationship of these mental health variables with participation in combat and peacekeeping missions.

METHODS

SURVEY

The present analysis was conducted using the CCHS-CFS. Data for the CCHS-CFS were collected in a joint collaboration by Statistics Canada and the Department of National Defense.⁵³ The survey used a multistage sampling framework to ensure the representativeness of the sample in relation to the Canadian military. The first stage of sampling was to divide the Canadian Forces by regular vs reserve membership. Reserve members were included in the target population if they had been active in the Canadian Forces in the previous 6 months. The second stage of sampling was stratification by rank and sex. For this purpose, military rank was grouped into 3 categories: junior grouping (included private, corporal, and master corporal), senior grouping (included sergeant, warrant officer, master warrant officer, and chief warrant officer), and officer grouping (included officer cadet, second lieutenant, lieutenant, captain, and major). Men were divided into these 3 levels of rank, and women were divided into 2 levels of rank (the senior and officer groupings were combined) because of smaller cell sizes for women. In each of these strata, the sample was further divided by region (Atlantic, Quebec, Ontario, and prairies) and Canadian Forces environment (air, land, sea, and communications). This approach was used to ensure proportional representation of units for each region and Canadian Forces element. Data were collected using face-to-face interviews by trained Statistics Canada interviewers in private on-base rooms between May 1 and December 31, 2002. The sample consisted of 5155 regular force members (response rate, 79.5%) and 3286 reserve force members (response rate, 83.5%).⁵³

MEASURES

Deployment-Related Traumatic Experiences

All the respondents were asked to answer the following 3 questions regarding deployment-related experiences within a more comprehensive 28-item trauma exposure measure: (1) "Have you ever participated in combat, either as a member of a military or as a member of an organized nonmilitary group?" (2) "Have you ever served as a peacekeeper or relief worker in a war zone or in a place where there was ongoing terror of people because of political, ethnic, religious, or other conflicts?"

(3) "Have you ever seen atrocities or massacres, such as mutilated bodies or mass killings?" No information was available as to the specific location of deployment. However, based on the age of the sample, it is likely that the military personnel included in the present survey were involved in several different missions, including those to Iraq (ie, the first Gulf War), Rwanda, Somalia, and the former Yugoslavia.

Mental Disorders

The content for the CCHS-CFS was partly based on a selection of mental disorders from the World Mental Health Survey Initiative.^{38,51,52} The World Health Organization CIDI Version 2.1 was used to generate diagnoses according to the definitions and criteria of the *International Statistical Classification of Diseases, 10th Revision (ICD-10)*⁵⁴ and the *DSM-IV*. The CIDI is a fully structured instrument for use by lay interviewers without clinical experience⁵⁵⁻⁵⁸ and has high levels of reliability and consistency with clinician-based diagnoses of *DSM* disorders assessed in the CCHS-CFS.⁴¹ The interviewers were trained according to World Mental Health standards. Each interviewer completed a 40-hour self-study module. After completion of this module and the self-administered tests embedded throughout the CD-ROM, the interviewer attended a 3-day training workshop at the CIDI Training and Research Centre. Those who successfully completed the training participated in the CCHS. In addition, mental health experts from the Center for Addiction and Mental Health (University of Toronto, Toronto, Ontario) provided training to raise awareness and sensitivity toward mental health issues. Details of the methods of the World Mental Health CIDI^{38,51,52} and the CCHS⁵⁹ have been published elsewhere.

Past-year prevalence of the following *DSM-IV* mental disorders was assessed in the CCHS-CFS: major depressive disorder, panic disorder, social phobia, generalized anxiety disorder, and PTSD. The diagnosis of PTSD was based on exposure to 28 possible traumatic events (eg, sexual assault, combat, and life-threatening illness). Details of the PTSD module and the whole survey content are available on request from the authors. If respondents noted multiple traumatic events, they were asked to identify the event that was most upsetting to them. Further questions to assess criteria B and C of PTSD were asked for the most upsetting event.

The CIDI Short Form was used to assess alcohol use disorders based on the criteria of the *DSM-IV*, where 3 symptoms or more indicated alcohol dependence.⁶⁰ Because alcohol abuse was not measured in the survey, we created a heavy alcohol use (HAU) variable based on previous literature.^{61,62} Past-year HAU was identified using the following question: "How often in the past 12 months have you had 5 or more drinks on 1 occasion?" Respondents chose from (1) never, (2) less than once a month, (3) 2 to 3 times a month, (4) once a week, and (5) more than once a week. Respondents who indicated "never" or "less than once a month" were classified as not having HAU, whereas the remaining respondents were classified as having HAU.

Perceived Need for Mental Health Care

The PNCQ, developed by Meadows et al,⁴⁶ was included in the CCHS-CFS. Data on the reliability and validity of the PNCQ have been previously published.⁴⁴⁻⁴⁶ The PNCQ assessed whether a respondent perceived a need for or received help for problems with emotions, mental health, or use of alcohol or drugs in the past year. Five categories were covered: (1) information about mental health problems, treatments, or available services; (2) medication; (3) therapy or counseling; (4) social in-

tervention (help for financial or housing problems); and (5) skills training (help for employment status, work situation, or personal relationships).

For each of these 5 categories, 4 possible levels of perceived need can be assigned: (1) no perceived need (did not perceive that they needed this type of help), (2) unmet need (perceived that they needed this type of help but received no service of this type), (3) partially met need (received this type of service but not as much as they perceived they needed), and (4) met need (received this type of service and received as much as they perceived they needed). An "all perceived needs" variable, indicating perceived need among any of the 5 categories, was derived by computing responses to all 5 categories of perceived need.

All respondents who indicated unmet need or partially met need were asked to choose from a list of possible barriers to care. Each respondent could choose multiple barriers. Compared with the PNCQ used in general population surveys, the PNCQ used in the CCHS-CFS included additional reasons for not seeking treatment that were specific to military populations (eg, "didn't have confidence in military health, administrative, or social services").

Mental Health Service Use

All respondents were asked whether they had seen or talked to a professional about their emotions, mental health, or use of alcohol or drugs in the past year. Professionals included a psychiatrist, family physician, general practitioner or medical officer, other medical physician, psychologist, nurse, nurse practitioner, physician's assistant or medic, social worker/counselor or psychotherapist, religious or spiritual advisor, or other professional (eg, acupuncturist, chiropractor, herbalist, and massage therapist). Past-year service use was indicated by endorsement of any of the aforementioned treatments.

Long-term Restriction of Activities

Respondents were asked whether a long-term physical health condition, mental health condition, or health problem had reduced the amount or kind of activity (1) "at home," (2) "at school," (3) "at work," or (4) "in other activities, for example, transportation or leisure." For each of the areas of reduced functioning, the respondent had the choice of (1) sometimes, (2) often, or (3) never. Owing to the skewed distribution of this variable, with 72.7% of the sample reporting "never" for all areas of functioning, the variable was dichotomized. Respondents indicating "never" for all areas of functioning were categorized as "not restricted," whereas the remaining respondents were categorized as "restricted."

Suicidality

Past-year suicidal ideation and suicide attempts were measured using 2 separate questions: (1) "Did you seriously think about committing suicide or taking your own life?" and (2) "Did you attempt suicide or try to take your own life?" The prevalence of past-year suicidal ideation was 3.8% (95% confidence interval [CI], 3.4%-4.4%). The prevalence of past-year suicide attempts was less than 1.0% (too low to be reported per Statistics Canada regulations to protect the confidentiality of respondents).

ANALYSES

Two estimation procedures were followed for all data analyses using this data set. First, we used the appropriate statistical

Table 1. Demographic Characteristics of the Sample

Characteristic	Prevalence, % (95% CI)
Sex	
M	85.3 (84.1-86.0)
F	14.7 (14.5-14.9)
Age, y	
16-24	19.3 (18.3-20.3)
25-34	30.7 (29.5-31.9)
35-44	37.5 (36.3-38.7)
45-54	12.6 (11.9-13.3)
Marital status	
Married/common-law	63.0 (61.8-64.2)
Separated/widowed/divorced	7.4 (6.8-8.1)
Never married	29.6 (28.5-30.8)
Household income, \$	
≥80 000	39.3 (38.1-40.4)
50 000-79 999	37.8 (36.6-39.1)
30 000-49 999	16.9 (15.9-18.0)
≤29 999	6.0 (5.4-6.7)
Education	
Bachelor's degree or higher	17.8 (17.2-18.5)
Any postsecondary school below bachelor's degree	30.2 (29.0-31.4)
High school or less	52.0 (50.8-53.2)
Type of service	
Regular	70.9 (69.8-71.9)
Reserve	29.1 (28.1-30.2)
Rank	
Junior grouping: private, corporal, and master corporal	59.8 (59.3-60.2)
Senior grouping: sergeant, warrant officer, master warrant officer, and chief warrant officer	20.1 (19.7-20.5)
Officer grouping: officer cadet, second lieutenant, lieutenant, captain, and major	20.1 (19.7-20.5)

Abbreviation: CI, confidence interval.

weights provided by Statistics Canada to ensure the representativeness of the data to the Canadian Forces target population. In all the analyses we provide unweighted numbers, which are based on the interviewed sample (N=8441). All the percentages and regression analyses are based on the weighted sample, which takes into account nonresponse and provides estimates that are generalizable to the Canadian military population. Second, Taylor Series Linearization in the SUDAAN program⁶³ was used to perform the necessary estimation of design-based standard errors required for data with a complex sample design.

We examined the sociodemographic characteristics of the sample; relationships among DSM diagnoses, PNCQ variables, and service use; and overlap among the 3 deployment-related events (combat, peacekeeping, and witnessing atrocities). The prevalences of met, unmet, and partially met needs in the whole sample and across each mental disorder were determined. Self-reported barriers to mental health service use were examined in respondents with partially met need and unmet need.

Two sets of multiple logistic regression analyses were conducted to examine the association between deployment-related events (combat exposure, peacekeeping exposure, and witnessing atrocities) and mental health outcomes (mental disorders, PNCQ, mental health service use, suicidal ideation, restriction of activities, and HAU): (1) adjusted for sociodemographic factors and (2) adjusted for sociodemographic factors

and for each of the other deployment-related events (ie, combat exposure, peacekeeping exposure, and witnessing atrocities were included in the same regressions). Sociodemographic covariates in the regressions included sex, age, marital status, educational level, income level, military rank (ie, junior, senior, or officer), and type of force (regular vs reserve). Results of stepwise regression analyses did not suggest that any of these covariates were redundant. Thus, all of the previously mentioned sociodemographic covariates were maintained in all the models.

RESULTS

Table 1 provides the sociodemographic factors assessed in the survey. Most of the sample was male, aged 25 to 44 years, married/common-law, and had a high school education or less. Most personnel included in the sample were regular members of the Canadian Forces and of junior rank.

The prevalences of exposure to combat, exposure to peacekeeping operations, and witnessing atrocities or massacres were 15.9%, 35.9%, 12.9%, respectively. **Table 2** gives the overlap of exposure to the 3 deployment-related traumatic events. Most individuals who reported exposure to combat or witnessing atrocities also had exposure to peacekeeping operations.

Table 3 gives the prevalence of mental disorders, perceived need for care, any mental health service use, suicidal ideation, long-term restriction of activities, and HAU. The 3 most common mental disorders in order of prevalence were major depression, alcohol dependence, and social phobia. The most commonly reported perceived needs were for counseling, skills training, and information. Suicidal ideation was reported by 3.8% of the sample.

Table 3 also demonstrates the association between deployment-related events and mental disorders, PNCQ, and other outcomes. Overall, the pattern of findings was that witnessing atrocities, exposure to combat, and exposure to peacekeeping operations were associated with the greatest, intermediate, and least likelihood of positive associations with mental health problems, respectively. For the sake of brevity, and because the pattern of findings was generally consistent, we present only regression models adjusting for sociodemographics and simultaneously adjusting for the other deployment-related traumatic events (Table 3). In these models, witnessing atrocities was strongly associated with most mental disorders, most perceived need variables, suicidal ideation, mental health service use, and long-term restriction of activities (adjusted odds ratios [AORs], 1.49-4.33). Exposure to combat was also associated with several dependent measures: any mental disorder, PTSD, long-term restriction of activities, any perceived need for treatment, perceived need for information, perceived need for counseling, perceived need for medication, and any mental disorder/perceived need/service use (AORs, 1.30-2.10).

Peacekeeping exposure, on the other hand, was found to be associated with a lower likelihood of past-year diagnosis of generalized anxiety disorder (AOR, 0.53; 95% CI, 0.33-0.87), perceived need for counseling (AOR, 0.79;

Table 2. Overlap of Deployment-Related Traumatic Events^a

Of All Those Exposed to	Those Who Also Had			
	Exposure to Peacekeeping Operations	Exposure to Combat	Witnessed Atrocities or Massacres	≥1 Other Trauma
Peacekeeping operations (n = 2596)	NA	80.3	84.2	49.3
Combat (n = 1117)	35.7	NA	49.1	82.7
Witnessing atrocities or massacres (n = 921)	30.0	39.3	NA	87.2

Abbreviation: NA, not applicable.

^aData are given as weighted percentages. All numbers are unweighted.**Table 3. Prevalence of Mental Disorders and Perceived Need for Treatment and the Association of These Variables With Deployment-Related Experiences^a**

Past 12-mo Variable	Whole Sample, Weighted % (95% CI) (N = 8441)	AOR (95% CI)		
		Exposure to Peacekeeping Operations (n = 2596) (RG: No Peacekeeping)	Exposure to Combat (n = 1117) (RG: No Combat)	Witnessing Atrocities or Massacres (n = 921) (RG: Not Witnessing Atrocities)
Any mental disorder ^b	14.9 (14.0-15.9)	0.89 (0.72-1.09)	1.37 (1.09-1.72) ^c	1.77 (1.39-2.26) ^c
Major depression	6.9 (6.2-7.6)	0.95 (0.72-1.25)	1.36 (1.01-1.83) ^d	1.82 (1.33-2.48) ^c
Panic disorder	1.8 (1.4-2.1)	0.82 (0.48-1.41)	1.51 (0.85-2.70)	2.30 (1.31-4.03) ^c
Social phobia	3.2 (2.8-3.7)	0.87 (0.60-1.27)	1.43 (0.94-2.18)	2.65 (1.75-4.02) ^c
Generalized anxiety disorder	1.7 (1.4-2.0)	0.53 (0.33-0.87) ^d	1.03 (0.57-1.86)	2.82 (1.60-4.97) ^c
Posttraumatic stress disorder	2.3 (2.0-2.8)	1.15 (0.71-1.86)	2.10 (1.28-3.45) ^c	4.33 (2.79-6.72) ^c
Alcohol dependence	4.8 (4.2-5.4)	0.91 (0.59-1.39)	1.17 (0.74-1.87)	0.98 (0.58-1.66)
Suicidal ideation	3.8 (3.4-4.4)	0.90 (0.63-1.27)	1.17 (0.80-1.71)	1.98 (1.37-2.86) ^c
Long-term restriction of activities	27.3 (26.2-28.5)	1.07 (0.93-1.24)	1.30 (1.09-1.55) ^c	1.43 (1.19-1.72) ^c
Heavy alcohol use	34.2 (32.9-35.4)	1.06 (0.91-1.24)	0.93 (0.77-1.12)	0.98 (0.80-1.20)
Any perceived need for treatment ^e	23.2 (22.1-24.3)	0.87 (0.74-1.02)	1.32 (1.09-1.59) ^c	1.49 (1.22-1.82) ^c
Information	11.4 (10.6-12.3)	0.93 (0.75-1.16)	1.50 (1.18-1.91) ^c	1.70 (1.33-2.18) ^c
Medication	6.0 (5.4-6.6)	0.77 (0.59-1.01)	1.60 (1.16-2.22) ^c	2.01 (1.44-2.80) ^c
Counseling	12.5 (11.7-13.4)	0.79 (0.64-0.97) ^d	1.28 (1.00-1.63) ^d	1.90 (1.48-2.43) ^c
Social intervention	4.1 (3.6-4.6)	0.63 (0.43-0.93) ^d	1.26 (0.81-1.94)	1.39 (0.88-2.21)
Skills training	12.4 (11.6-13.3)	0.91 (0.74-1.11)	1.24 (0.97-1.58)	1.62 (1.25-2.09) ^c
Any mental health service use	12.8 (12.0-13.7)	0.92 (0.76-1.13)	1.19 (0.94-1.51)	1.69 (1.32-2.16) ^c
Any mental disorder diagnosis, service use, or perceived need	31.0 (29.8-32.2)	0.89 (0.76-1.03)	1.30 (1.09-1.55) ^c	1.50 (1.24-1.82) ^c

Abbreviations: AOR, adjusted odds ratio (adjusted for sex, age, marital status, income, education, military rank [junior, senior, or officer], type of force [regular vs reserve], and other deployment-related traumatic events); CI, confidence interval; RG, reference group.

^aAll numbers are unweighted.^bThe reference group for these regressions is "no past-year mental disorder."^cP < .01.^dP < .05.^eThe reference group for these regressions is "no perceived need."

95% CI, 0.64-0.97), and perceived need for social intervention (AOR, 0.63; 95% CI, 0.43-0.93) in models adjusting for combat and witnessing atrocities (Table 3). In regression models that adjusted only for sociodemographic factors and did not adjust for other deployment-related traumatic events, peacekeeping operations were significantly associated with the following 3 variables: past-year diagnosis of PTSD (AOR, 2.47; 95% CI, 1.68-3.63), perceived need for information (AOR, 1.26; 95% CI, 1.05-1.53), and long-term restriction of activities (AOR, 1.27; 95% CI, 1.11-1.45). However, in adjusted models where exposure to combat and witnessing atrocities were included in the same regression, these associations became nonsignificant (Table 3).

Table 4 provides the prevalence of perceived need in relation to the presence of DSM diagnosis and service

use. Thirty-one percent of the sample had at least 1 of the following: perceived need, service use, or a DSM diagnosis of mental disorders. Of the 14.9% of the sample that met the criteria for a mental disorder, few of these individuals sought any professional help (ie, 6.1% of the total sample). A significant proportion of the sample, 4.7%, had perceived a need for care and used services without a DSM diagnosis.

A large proportion of the sample (9.7%) had perceived a need for mental health care without meeting the criteria for a DSM diagnosis or using services. We conducted supplementary analyses to determine whether this group differed from those without perceived need, service use, or a DSM diagnosis on measures of disability, suicidal ideation, and history of (ie, before the past year) mental disorder. We found that respondents with perceived

Table 4. Prevalence Rates for the Various Combinations of DSM Diagnosis, All Perceived Needs, and Mental Health Service Use

Past 12 mo				
Any DSM Diagnosis ^a	All Perceived Needs ^b	Any Service Use ^c	Unweighted No.	Weighted % (95% CI)
Yes	Yes	Yes	461	5.8 (5.2-6.4) ^d
Yes	No	Yes	26	0.3 (0.2-0.5)
Yes	No	No	389	5.6 (5.0-6.3)
Yes	Yes	No	236	3.1 (2.7-3.6)
No	No	Yes	161	1.9 (1.6-2.3)
No	Yes	Yes	446	4.7 (4.2-5.3)
No	Yes	No	770	9.7 (8.9-10.4)
No	No	No	5659	69.0 (67.8-70.2)

Abbreviation: CI, confidence interval.

^aAny of the following mental disorders: major depression, panic disorder, generalized anxiety disorder, posttraumatic stress disorder, social phobia, and alcohol dependence.

^bAll categories of perceived need (information, medication, therapy or counseling, social intervention, and skills training).

^cAny service use for emotional problems in all sectors (professional services [eg, physician and psychologist], complementary and alternative services [eg, herbalist and acupuncturist], and human services [eg, religious or spiritual advisor]).

^dOf the total sample, 5.8% had the presence of at least 1 DSM diagnosis, perceived a need for mental health treatment, and indicated mental health service use.

Table 5. Prevalence of Categories of Perceived Need and Levels of Met Need in the Survey^a

Category	No Need, %	Any Need, %			Total
		Not Met	Partially Met	Fully Met	
Whole sample (N = 8441)					
Information	88.6	3.4	1.2	6.8	11.4
Medication	94.0	0.6	0.3	5.1	6.0
Therapy or counseling	87.5	3.4	2.1	7.0	12.5
Social intervention	96.0	2.1	0.4	1.6	4.1
Skills training	87.6	5.7	2.1	4.6	12.4
All perceived needs	76.8	6.3	6.5	10.4	23.2
Any past 12-mo mental disorder (n = 1128)					
Information	63.7	11.5	5.4	19.5	36.4
Medication	72.2	2.6	1.6	23.7	27.9
Therapy or counseling	57.1	10.9	8.6	23.4	42.9
Social intervention	89.1	5.2	1.4	4.2	10.8
Skills training	63.9	16.0	7.8	12.2	36.0
All perceived needs	40.1	12.8	25.4	21.6	59.8
No mental disorder diagnosis (n = 7057)					
Information	92.8	2.1	0.5	4.6	7.2
Medication	97.8	0.2	0.1	1.9	2.2
Therapy or counseling	92.7	2.1	1.0	4.2	7.3
Social intervention	97.0	1.6	0.2	1.2	3.0
Skills training	91.7	3.9	1.1	3.3	8.3
All perceived needs	83.1	5.2	3.3	8.4	16.9

^aAll numbers are unweighted. All percentages are weighted.

need and no help seeking or DSM diagnosis had significantly higher odds of reporting past-year suicidal ideation (OR, 3.04; 95% CI, 1.83-5.05), long-term restriction of activities (OR, 1.73; 95% CI, 1.43-2.10), and history of meeting the criteria for a mental disorder (OR, 2.33; 95% CI, 1.88-2.90) than the group without perceived need, help seeking, or DSM diagnosis.

Table 5 demonstrates that in the whole sample 23.2% had at least 1 category of perceived need for mental health treatment. When examining the whole sample, and those with and without a mental disorder, the 3 most common categories of perceived need were therapy/coun-

seling, skills training, and information. A perceived need for medication treatment was the most likely to be fully met compared with the other categories of perceived need. For example, of the 6.0% of the total sample that reported a need for medication, 85% reported a fully met need (ie, 5.1% of the total sample). In contrast, in the 12.5% of the total sample that reported a need for therapy or counseling, 56% reported a fully met need (ie, 7.0% of the total sample).

Table 6 gives the prevalence of all perceived needs across each of the mental disorders assessed in the survey. There was significant variation across the mental disorder-

Table 6. Prevalence of Perceived Need for Care Among Participants With Specific Mental Disorders^a

Past 12-mo Mental Disorder	All Perceived Needs, % ^b				
	No Need	Any Need			Total
		Not Met	Partially Met	Fully Met	
Major depressive disorder (n = 563)	21.6	14.3	36.2	27.9	78.4
Panic disorder (n = 137)	10.4	7.5	48.6	33.5	89.6
Social phobia (n = 260)	33.5	9.4	30.7	26.4	66.5
Generalized anxiety disorder (n = 144)	15.7	14.7	51.1	18.5	84.3
Posttraumatic stress disorder (n = 179)	21.9	14.8	38.3	25.0	78.1
Alcohol dependence (n = 302)	63.4	11.7	14.0	10.9	36.6

^aAll numbers are unweighted. All percentages are weighted.

^bAll categories of perceived need (information, medication, therapy or counseling, social intervention, and skills training).

ders in the likelihood of reporting perceived need for treatment. Respondents with panic disorder had the highest likelihood of indicating any perceived need, whereas respondents with alcohol dependence had the lowest likelihood of reporting perceived need. Consistent across all the mental disorders was the finding that only a few individuals reported that they received all the help that they required; a substantial proportion reported that their needs were partially met.

Table 7 gives the perceived barriers to care among respondents who perceived a need for treatment but either did not receive any treatment or did not receive as much treatment as they believed they required. The 2 most commonly indicated barriers to care were “didn’t have confidence in military health, administration, or social services” and “other.”

COMMENT

Findings from the present investigation should be interpreted in the context of the following limitations. Although the mental disorders and PNCQ variables were assessed based on highly reliable standardized diagnostic interviews conducted by trained personnel, the validity of these diagnoses and the PNCQ may not match that of diagnoses made by trained clinicians.⁶⁴ The cross-sectional design of the survey precludes any causal interpretations of the associations found in this study. Because the present survey was anonymous, it is not possible to cross-check through military records the reliability of self-reported exposure to deployment-related traumatic events. However, the recent study by Dohrenwend et al,¹² which used military records to determine the reliability of self-reported combat exposure, did not find evidence of falsification of self-reported combat exposure. Although the list of deployment-related traumatic events has been abstracted from a standard instrument (WHOCIDI) used in multiple general population surveys, the reliability of these measures might differ in military samples. The general nature of the 3 deployment-related traumatic events might lead to biased associations. The recency of exposure to traumatic events or deployments was not available in the present survey. Recent evidence suggests that the length of time between deployment and onset of emotional symptoms may affect

Table 7. Prevalence of Perceived Barriers to Care Among Respondents With Partially Met Need and Unmet Need^a

Barrier to Care	Partially Met Need, % (n = 376)	Unmet Need, % (n = 862)
Did not know where to go	12.5	22.0
Language problems	2.3	1.8
Could not afford to pay	5.5	4.8
Job interfered (eg, workload, hours of work, or no cooperation from supervisor)	20.0	16.9
Have not gotten around to it	13.6	24.3
Afraid of what others would think	11.6	19.5
Help not readily available	19.9	16.6
Did not have confidence in military health, administrative, or social services	30.1	38.1
Other	50.4	32.2

^aAll numbers are unweighted. All percentages are weighted.

the course of mental disorders.^{3,36} Finally, because respondents in the survey could have been involved in multiple different deployments and specific information of the location of deployments was not available, the present findings cannot be directly compared with other studies that have focused on the mental health consequences of specific deployments (eg, Iraq^{9,18,65} and Afghanistan⁹). In light of these limitations, there are 5 important findings of the present study.

First, through the use of a representative sample of active military personnel and multiple methods of assessing need for mental health services (ie, DSM diagnosis, perceived need, and mental health service use), the present study provides evidence of an association between combat exposure and witnessing atrocities and negative mental health outcomes. These findings are consistent with most studies in the literature showing a strong link between combat exposure and self-report symptoms and mental health service use.¹⁷ Of the deployment-related variables, witnessing atrocities had the strongest association with mental disorders and service use. These findings, together with the recent finding of a dose-response relationship between exposure to traumatic events and PTSD,^{4,12} suggest that exposure to traumatic experiences during deployment—rather than deploy-

ment, per se—increases the risk of mental health problems after deployment. Based on these data, postdeployment intervention strategies may consider targeting soldiers who have had high levels of exposure to traumatic events during deployment.

Second, the relationship between peacekeeping operations and mental disorders and perceived need for treatment was complex in this study. In regression models that did not adjust for exposure to combat and witnessing atrocities, exposure to peacekeeping operations was associated with an increased likelihood of some outcome variables (ie, PTSD, perceived need for information, and long-term restriction of activities). However, after adjusting for the effects of exposure to combat and witnessing atrocities, participation in peacekeeping operations was not associated with increased likelihood of mental health problems. On the contrary, peacekeeping operations were associated with a lower likelihood of generalized anxiety disorder, perceived need for counseling, and perceived need for social intervention in the present study. These findings can be interpreted to mean that peacekeeping operations can have a variety of positive and negative aspects.^{7,19,31,35} Soldiers may experience a variety of negative aspects of peacekeeping operations, which include exposure to combat and feelings of powerlessness and frustration because of having to refrain from using force during a dangerous mission. Positive aspects of peacekeeping operations include events or circumstances that might have been experienced as fulfilling and gratifying for military personnel.⁷ Soldiers may find gratification in their humanitarian role (eg, providing humanitarian aid to suffering civilians) and pride in service to their country. The present findings, together with previous literature,^{7,19,31,35} suggest that exposure to combat and witnessing atrocities during peacekeeping operations is likely to place soldiers at risk for mental health problems after deployment. However, soldiers returning from peacekeeping operations who did not have exposure to combat and did not witness atrocities may be at lower risk for certain mental disorders and perceived need. Owing to the cross-sectional nature of the survey, we cannot conclude whether peacekeeping operations lead to a lower risk of these problems or whether soldiers who have lower risk of these problems are more likely to be deployed to peacekeeping missions. Further replication of these findings is required.

Third, the present study is the first to demonstrate in a large military sample that self-perceptions of need for mental health services, mental health service use, and prevalence of common mental disorders are not closely related. These findings are consistent with those from general population samples and suggest that assessing the population level of need for mental health services based solely on meeting the criteria for common mental disorders may be an invalid approach.⁶⁶ Using a conservative estimate of meeting diagnostic criteria for a mental disorder assessed in this survey, approximately 15% of the sample would be considered in need of mental health services. These prevalence rates are similar to recent data from the United States.^{4,9} However, if we use a broader criterion of meeting 1 of the following 3 categories—DSM diagnosis, perceived need, or service use—more than

30% of the population would be considered in need of mental health services. Together with the findings that most individuals with a mental disorder did not receive any mental health services or believed that they did not receive as much help as they required, these observations suggest that untreated mental illness in the Canadian military is an enormous problem. Recently, there has been a move to screen for PTSD and depression in military soldiers returning from combat.⁶⁷ The present findings suggest that a broader assessment of mental disorders and self-perceived need for treatment may also be useful. A short PNCQ for use in primary care⁶⁸ has been developed that may be useful to test in military primary care clinics.

Fourth, the current pattern of results related to perceived need is similar to previous findings in general population surveys. A perceived need for counseling or therapy was most prevalent. Similar to general population samples,⁴⁶ a significant proportion of respondents with perceived need for therapy did not receive as much therapy as they believed they required. On the other hand, a perceived need for medication was most likely to be fully met. This finding is also similar to previous general population samples, and previous researchers have hypothesized that this might be due to the easier access to medications in primary care clinics than to counseling services.

Fifth, the most common specific (ie, after the “other” category) self-reported barrier for not receiving as much treatment as desired was a lack of confidence in the services available in the military. The high rate of endorsement of the “other” category suggests that important barriers to mental health service use were not assessed in the survey. These findings need to be interpreted in the context that Canadian military personnel have few structural barriers to deter them from receiving mental health services. The present findings may not be generalizable to other countries that may have different health care systems for military personnel. Future qualitative studies may facilitate a more in-depth understanding of perceived barriers to care among military personnel.

In conclusion, this study provides strong data to demonstrate the unique association between exposure to combat and witnessing atrocities and mental disorders and self-perceived need for treatment. These findings underscore the importance of improving services, education, and outreach to military personnel with emotional problems or perceiving a need for treatment. There has been a move in general population samples to provide mental health treatment in primary care settings to reduce the barriers and stigma related to seeking mental health services.^{69,70} Such efforts may be important in military primary care clinics as well.

Submitted for Publication: August 22, 2006; final revision received December 16, 2006; accepted December 27, 2006.

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Financial Disclosure: None reported.

Funding/Support: Preparation of this article was supported by New Emerging Team grant PTS-63186 from the Canadian Institutes of Health Research (CIHR) Institute of Neurosciences, Mental Health and Addiction, a CIHR operating grant, the Manitoba Health Research Council Establishment and CIHR New Investigator grants (Dr Sareen), Career Development (K24) Award MH64122 from the National Institutes of Health (Dr Stein), a CIHR Investigator Award (Dr Asmundson), and a Canada Research Chair (Dr Cox).

Disclaimer: The opinions expressed in this article do not represent the opinions of Statistics Canada.

Additional Contributions: The CCHS-CFS was conducted by Statistics Canada and Canadian Forces. Randy Boddam, MD, FRCPC, contributed to the design of the survey. Dr Boddam and Mark Zamorski, MD, MHSA, provided comments and feedback on the manuscript. We thank Jina Pagura, BSc (Hons), Gregory E. Ratcliffe, BSc, James Bolton, MD, FRCPC, and Natalie Mota, BA (Hons), for their assistance in manuscript preparation.

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