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Occupational Trauma and Mental Illness: Combat, Peacekeeping or Relief Work and the NCS-R

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Abstract

Objective—Peacekeepers, relief workers and military members experience multiple traumas, and trauma is believed to increase risk for psychiatric distress. We examined whether combat and/or peacekeeping or relief work was associated with subsequent mental illness.

Methods—Using data from the US National Co-morbidity Survey Replication (NCS-R) (n = 2,383), we estimated whether combat, peacekeeping or relief work were associated with increased prevalence of mental illness through bivariate cross-tabulations and multivariate logistic regression.

Results—Combat was associated with increased subsequent post-traumatic stress disorder (PTSD), alcohol or drug issues more than peacekeeping or relief work.

Conclusions—Combat, alone or combined with peacekeeping/relief work, appears to be a risk factor for subsequent PTSD and issues with drugs and alcohol. Peacekeeping/relief work without combat does not appear to be associated with these diagnoses.

Introduction

As global conflicts, natural disasters, and other complex emergencies rise, use of military, peacekeepers and relief workers has increased[1,2]. Combat related trauma and subsequent mental illness has been noted since World War I[3], and persists in subsequent conflicts[4,5,6,7,8]. Recent research suggests peacekeepers and relief workers also face trauma during assignment, and may subsequently experience mental illness.

Like military combatants, peacekeepers and relief workers risk their own safety and are concurrently exposed to secondary trauma through witnessing others' suffering—both populations they serve and colleagues—while separated from family and *home-based* sources of support. Peacekeepers are exposed to gunfire and shelling, witness large-scale violence or atrocities, engage in dangerous patrols, suffer combat related injuries and

rejection by the local population[9,10,11,12]. Relief workers experience threats such as sniper or gunfire, being chased, threatened, shelled, or bombed, and suffer personal injuries, landmine injuries, kidnapping or hostage taking, violent wounds or sexual assault, road accidents, or life-threatening illness[13,14,15].

As a consequence of this psychological trauma exposure, peacekeepers and relief workers may suffer impaired mental health, though results are mixed. In a population-based study of Canadian military combat and peacekeeping veterans, 14% reported a past-year mental disorder (depression, 6.9%; alcohol dependence, 4.8%; and social phobia 2.3%). Odds ratios were lower and not significant among peacekeepers[16]. Most mental health outcomes were unrelated to combat or peacekeeping[17]. Rates of PTSD among peacekeepers from Norway[18], the UK[19,20], the Netherlands [10], New Zealand [21] ranged from 3–16%. Those with peacekeeping experience do not appear to have higher rates of suicide than the general population[22,23,24,25].

There is less research on mental health of relief workers. The largest study investigated risk factors for psychological morbidity among national and ex-patriot workers in Kosovo[15], and found trauma exposure increased risk of symptoms of mental illness. Symptoms of PTSD were in normal ranges while 17.2% of ex-patriots and 16.9% of Kosovar relief workers reported symptoms of depression, and anxiety. Smaller studies on PTSD among US[14], Turkish[26] and Singapore relief workers[27] identified rates of PTSD among relief workers ranging from 8–43%. Other studies reported elevated symptoms of PTSD, depression and anxiety among relief workers[13, 28].

Using a nationally representative sample of US men from the National Co-Morbidity Survey Replication (NCS-R) we examined whether exposed to combat participation or service as a peacekeeper or relief worker was associated with subsequent mental illness.

Methods

Study Subjects and Procedure

Subjects were drawn from the National Co-Morbidity Survey Replication (NCS-R) section on PTSD. The NCS-R is a national probability sample from all racial and ethnic groups administered between 2001 – 2002 to assess the prevalence levels and correlates of psychiatric disorders according to the criteria of the revised Diagnostic and Statistical Manual (DSM-IV). The survey was part of the World Mental Health Survey Initiative (WMH) and used the Composite International Diagnostic Interview (CIDI)[29].

The survey identified 9,282 English speaking American adult subjects over 18 years of age through a multi-stage clustered area probability sample of households. Subjects were assessed for prevalence and correlates of psychiatric disorders, estimating for 30-day, 12 month and lifetime prevalence. The NCS-R was administered by trained lay interviewers through a structured survey on laptop computers and the Computer Assisted Personal Interviewing (CAPI)[30].

Part I of the survey was administered to all respondents, included the core diagnostic interview and core correlates, and was weighted to adjust for differential probability of selection and to post-stratify for demographic variables. Part II included additional disorders, was administered to 5,692 respondents who had certain risk factors or consequences or who had utilized services, with over-sampling of those with clinically significant pathology, and was weighted to ensure the sample is nationally representative. Questions related to PTSD are in Part II of the survey.

Measures

Part II of the NCS-R asked about exposures to participation in combat or service as a peacekeeper or relief worker. Questions on combat asked, 'did you ever participate in combat, either as a member of a military, or as a member of an organized non-military group?' Questions about peacekeeping or relief work asked, 'did you ever serve 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?'

The NCS-R also included questions about psychiatric diagnoses and related behavior. Trauma-related outcomes examined were major depression, general anxiety disorder, PTSD, alcohol abuse and dependence, and drug abuse and dependence. We controlled for race and age of exposure to combat participation or peacekeeping/relief work, and age of onset of the specific psychiatric diagnoses.

Analysis

Survey subjects were classified into binary categories of exposed (to combat, peacekeeping/relief work, or both) vs. unexposed, and divided into three groups 1) combat and peacekeeping/relief work, 2) combat only, and 3) peacekeeping/relief work only. There were 288 respondents exposed to combat or peacekeeping/relief work and only 16 were female. Given the small number of exposed females, we limited the analysis to the sample of exposed males (n=272) and compared them with the general population of unexposed males in Part II of the NCS-R (n= 2,110).

We estimated whether exposure was associated with increased prevalence of mental illness through weighted bivariate cross-tabulations and multivariate logistic regression analysis. Due to significant co-morbidity between both alcohol abuse and alcohol dependence, and drug abuse and drug dependence, we combined the substance abuse variables into 'alcohol abuse/dependence' and 'drug abuse/dependence'. Analysis was conducted in Stata version 10.

We determined temporal order by examining the relationship between first age of onset of psychiatric diagnoses of interest, and first age of exposure to combat or peacekeeping/relief work. We identified exposed subjects who had onset of the specific diagnosis prior to exposure, and removed them from the analysis. We also removed unexposed subjects who had onset of a diagnosis prior to the average age (age 20) of initial exposure to combat or peacekeeping/relief work. For example, regression on the outcome of major depression removed cases in which depression preceded exposure to combat or peacekeeping/relief work, and also removed cases among unexposed subjects who experienced depression before age 20.

Results

Of the total sample of 2,382 males in Part II of the NCS-R, 233 participated in combat, 69 had experience as a peacekeeper or relief worker in a war zone, and 31 subjects affirmed both. We classified subjects into three groups, with 31 subjects in group 1 (exposed to both combat and peacekeeping/relief work), 203 in group 2 (combat only), and 38 in group 3 (peacekeeping/relief work only).

On average, those exposed to combat or peacekeeping/relief work were older and more diverse than those unexposed. (Table 1.) The mean age of exposed respondents (55 years) was more than a decade older than unexposed respondents (43.8 years). The mean age for first exposure was 20.6 years. More than half of exposed subjects (139/279) had a diagnosis of interest, and half of these (70/139) had more than one diagnosis.

Examining the onset of psychiatric diagnoses, we found in many cases diagnosis preceded exposure to combat participation or to peacekeeping/relief work. (Table 2.) For example, among exposed with lifetime diagnoses of major depression, 27% had depression prior to exposure. These 19 respondents were eliminated from the analyses involving depression. Among the diagnoses, PTSD was more likely to occur within the same year as that of first exposure; over 60% of the PTSD cases reported were first reported during the first year of exposure.

Exposure to combat renders results significant, whereas absent combat there was no significant relationship. From this we conclude that combat is a factor responsible for higher rates of PTSD, drug and to a lesser extent alcohol issues among men exposed to peacekeeping or relief work. For example, among all the exposed, 7% subsequently suffered from PTSD, compared to 1% of the unexposed. This relationship held for those exposed to combat only or combat and peacekeeping/relief work, but not for those exposed to peacekeeping/relief work only.

These results held in the multivariate analyses. The subsequent lifetime risk of PTSD was significantly higher for both groups exposed to combat [group 1, OR= 11.2 (CI 2.9–43.2) and group 2 OR = 7.3 (CI 3.3–15.8)]. Drug abuse/dependence was also significantly higher among respondents exposed to combat. Alcohol abuse/dependence was barely significant for those exposed to combat only, with an odds ratio of 1.6 (CI 1.0–2.7) (Table 3).

Discussion

Among our group of males exposed to peacekeeping, relief work, and combat, those exposed to combat were significantly more likely than the general public to develop higher rates of PTSD and drug problems. Combat exposure also appeared to be a potential risk factor for developing alcohol problems. PTSD from combat seems to occur quickly, while most of the effects of combat exposure on drug and alcohol dependence are delayed (Table 2). By contrast, a study of Vietnam veterans in treatment for PTSD found delayed onset was not uncommon[31].

Our findings on pre-exposure psychiatric diagnoses were consistent with the recent Congressional mandate to conduct in-person mental health screening for members of the Armed Forces deployed in connection with a contingency operation[32].

In our study, peacekeepers/relief workers not exposed to combat were no more likely to develop a diagnoses than the general population of unexposed males. We caution against drawing strong conclusions concerning this null finding due to small numbers of subjects (n = 38). Other researchers examining mental illness among relief workers have found elevated psychiatric diagnoses compared with the general population[13, 14, 15, 26, 27, 28].

Implications

This study has potential implications for service planning and occupational health policy for those in combat, peacekeeping or relief work. Pre-screening of military deployed to combat/contingency operation has reduced mental health problems and medical evacuations from the field[33]. Such pre-screening can also inform practice for pre-deployed peacekeepers and relief workers.

This study also has implications for data collection. The World Mental Health Survey, and other psychiatric epidemiology surveys, combine questions on peacekeeping and/relief work. Given differences between these populations, and our different findings for those in

group 1 (likely to be military peacekeepers) and those in group 3 (likely to be relief workers), future surveys should differentiate between them.

While there has been longitudinal research on combat veterans and on peacekeepers, we did not identify published longitudinal studies on relief workers. Future research should collect baseline data on subjects that include previous symptoms of mental illness and previous trauma exposures, and information on timing of the onset of mental illness.

Limitations and Strengths

Our study has methodological limitations and should be considered hypothesis generating more than hypothesis testing. For example, lacking occupational labels for subjects, we can only infer that those in group 1 were military peacekeepers or military members who later became relief workers, those in group 2 were military combat veterans who never engaged in peacekeeping, and those in group 3 were civilian relief workers.

While the NCS-R sample is large, the number exposed to combat was small, and those exposed to peacekeeping or relief work smaller still. Although the NCS-R was administered by trained interviewers, responses were self-reported and not validated by any other source. On average, the survey was conducted 35 years after first exposure to combat or to peacekeeping/relief work, which increased likelihood of recall bias. Psychiatric illness occurring years after combat or peacekeeping/relief work may or may not be related. Subjects may experience other trauma between combat or peacekeeping/relief work and onset of diagnosis. This analysis therefore identifies an association between these exposures and mental illness, not a causal relationship. We were not able to identify or control for potential additional lifetime trauma exposure.

An important limitation is the nature of the question on peacekeeping and relief work included in the NCS-R. The survey combines peacekeeping and relief work in a single category, without accounting for the large differences between them. Females weren't included in this analysis, so results can only be generalized to male soldiers, peacekeepers, or relief workers. These data were collected in 2001 – 2002, before the onset of the US war with Iraq and concurrent with the beginning of the Afghanistan war. Therefore results may not be generalizable to veterans of these conflicts.

The study has strengths, including the nature of the NCS-R survey. We were unable to find another study of US peacekeepers or relief workers that used population based data such as the NCS-R—a representative sample of the US adult population with diagnostic measures validated by comparison with clinician diagnoses[30]. We believe this article is the first use of a World Mental Health survey to study peacekeeping or relief work. The NCS-R capacity to identify onset of diagnoses is a particularly rich feature that allowed us to sequence onset of mental illness and exposure to combat or peacekeeping/relief work, and to construct an appropriate comparison group for analysis.

Finally, this study is timely. Global conflict, disasters, and other complex emergencies are increasing, as has use of military troops, peacekeepers, and relief workers. These critical workers need ongoing support as they deploy to and return from war and other complex emergencies.

Conclusion

We find there is an association between combat participation and subsequent post-traumatic stress disorder, drug problems, and perhaps alcohol problems. Service as a peacekeeper or relief worker without combat participation was not associated with any diagnosis in our

study, but the sample size was small and this is difficult to interpret. Future research should control for previous psychiatric diagnoses and other trauma exposure.

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Clinical Significance

We found an association between combat and subsequent post-traumatic stress disorder, drug and alcohol issues. Absent combat, peacekeeping or relief work were not associated with mental illness. Previous diagnoses and trauma exposure may increase potential for subsequent mental health problems.

Table 1

Demographic characteristics for sample of males exposed to combat and/or to peacekeeping or relief work (n=272)

	Group 1 Combat & Peacekeeping/ Relief Work (n=31)	Group 2 Combat Only (n=203)	Group 3 Peacekeeping/Relief Work Only (n=38)	Total Sample of Exposed (n=272)	Total Males, Unexposed (n=2,110)
Mean Current Age (SE)	49.0 (2.2)	56.6 (1.1)	51.5 (2.2)	55.0 (.9)	43.8 (.9)
Mean Age of Exposure (SE)	18.8 (.73)	20.5 (.28)	21.8 (.49)	20.6 (.23)	n/a
Race*					
White	20 (64%)	151 (74%)	28 (73%)	199 (73%)	2,879 (74%)
Black	7 (22%)	33 (16%)	6 (15%)	46 (16%)	417 (10%)
Hispanic	2 (6%)	11 (16%)	3 (7%)	16 (5%)	376 (9%)
Other	2 (6%)	8 (3%)	1 (2%)	11 (4%)	195 (5%)

*Imputed race data, #(%)

Table 2

Timing of onset of exposure to combat participation and/or peacekeeping or relief work compared with onset of diagnosis n(%)

	n(%)Diagnosis Before Exposure	n(%)Diagnosis Concurrent with Exposure	n(%)Diagnosis After Exposure	*Total # of Diagnoses*
Major Depression	19 (27)	5 (7)	47 (66)	*71*
Generalized Anxiety Disorder	9 (30)	3 (10)	18 (60)	*30*
Post-Traumatic Stress Disorder	4 (14)	18 (62)	7 (24)	*29*
Alcohol Abuse/Dependence	28 (37)	6 (8)	41 (54)	*75*
Drug Abuse/Dependence	10 (24)	5 (12)	26 (63)	*41*
Any diagnoses	70 (28)	37 (15)	139 (56)	*246*

Table 3

Association OR(CI) between exposure to combat participation and/or peacekeeping or relief work and subsequent mental illness (n=271)[ii]

	Group 1, Peacekeeping/ Relief Work and Combat (n=31)	Group 2, Combat Only (n=203)	Group 3, Peacekeeping/ Relief Work Only (n=38)
Major Depression (n=2,120)	1.3 (.48–3.4)	1.1 (.66–1.8)	1.1 (.44–2.5)
Generalized Anxiety Disorder (n=2,299)	1.5 (.42–5.4)	1.2 (.62–2.1)	.33 (.04–2.5)
Post Traumatic Stress Disorder (n=2,281)	11.2 (2.9–43.2)	7.3 (3.3–15.8)	n/a[iii]
Combined Alcohol Abuse/Dependence (n=1,983)	1.5 (.57–4.0)	1.6 (1.0–2.7)	.31 (.06–1.4)
Combined Drug Abuse/Dependence (n=2,096)	3.8 (1.3–10.3)	3.7 (1.9–7.2)	1.4 (.40–5.0)
Any Diagnoses (n=1,710))	2.6 (1.0–6.4)	2.0 (1.3–3.0)	1.0 (.44–1.0)

[ii] Exposed subjects diagnosed prior to the age at which they participated in combat or peacekeeping/relief work were removed from this analysis; unexposed subjects diagnosed before average age of combat or peacekeeping/relief work were also removed. Those diagnosed at the same age as combat or peacekeeping/relief work or later were left in the models.

[iii] There was only 1 case of PTSD among group 3, and it preceded exposure.