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Original article

Incidence of and risk for post-traumatic stress disorder and depression in a representative sample of US Reserve and National Guard

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ABSTRACT

Purpose: We aim to determine the incidence rates (IR) of first-ever post-traumatic stress disorder (PTSD) and depression in a population-based cohort of US Reserve and National Guard service members.
Methods: We used data from the US Reserve and National Guard Study ($n = 2003$) to annually investigate incident and recurrent PTSD and depression symptoms from 2010 to 2013. We estimated the IR and recurrence rate over 4 years and according to several sociodemographic and military characteristics.
Results: From 2010 to 2013, IRs were 4.7 per 100 person-years for both PTSD and depression symptoms using the sensitive criteria, 2.9 per 100 person-years using the more specific criteria, recurrence rates for both PTSD and depression were more than 4 times as high as IRs, and IRs were higher among those with past-year civilian trauma, but not past-year deployment.
Conclusions: The finding that civilian trauma, but not past-year military deployment, is associated with an increased risk of PTSD and depression incidence suggest that Reserve National Guard psychopathology could be driven by other, nonmilitary, traumatic experiences.

Introduction

Mental illness is a major health concern in the US armed forces, particularly among the Reserves and National Guard (reserve component) [1]. The reserve component includes more than 1.2 million Army and Air Nation Guardsmen and members of the Army, Navy, Marine, Air Force, and Coast Guard Reserve. Whereas the active component deploys worldwide at the command of the President or Congress, the National Guard largely supports individual states, and reserves are a trained operational force in reserve ready to augment active component forces when required. After the Vietnam War, however, the Department of Defense adopted the Total Force Policy that treated the two components (i.e., active and reserve component) as a single operational force. Thus, during the height of mobilization in Operation Enduring Freedom and Operation Iraqi Freedom, reserve component forces constituted about 40% of deployed service members in combat operations.

Investigations to date have indicated that the reserve component suffers a greater burden of psychiatric disorders compared to the active component, specifically depression and post-traumatic stress disorder (PTSD) [1–4]. Studies have shown that the combined prevalence of depression and PTSD is about 20% in the general reserve population [3,5] and more than 30% in postdeployment reservists [2,6,7]. No previous study, to our knowledge, has documented first onset incidence rates and absent incidence estimates our understanding of the contribution to this prevalence of new-onset disease compared to disease duration remains unknown. Furthermore, there are no studies that have considered incidence among Reserve and National Guard service members, which leave a substantial data gap that can inform approaches to try to minimize the development of psychiatric disorders among this population.

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Three gaps exist in understanding the risk of depression and PTSD in the military. First, extant military studies have reported either the cross-sectional prevalence or proportion of "new-onset" cases. New-onset cases are qualified only by the absence of a disorder at the baseline interview and disorder diagnosis at a later interview, rather than absence of a lifetime history of disorder at baseline. Because depression and PTSD can be chronic and recurrent disorders [8,9] and new-onset estimates conflate first incidence disorders with recurrent disorders (i.e., disorders absent at baseline interview but present at later wave), new-onset estimates are likely to overestimate first onset incidence rates. Therefore, the accurate assessment of psychiatric disorder risk during military services requires that lifetime symptoms be assessed at baseline. Second, much of what we know about the risk of and burden for depression and PTSD in the military comes from active-duty personnel. Generalizability of risk estimates derived from active-duty forces to reservists may be limited given reservists' unique experiences as citizen soldiers. Specifically, reservists are part-time soldiers—generally serving one weekend a month and 15 days annually; however, this dual role as citizen soldiers also contributes to unique stressors not experienced by active-duty forces (e.g., cycling between civilian employment and military deployments, limited access to mental health services). Finally, much of what we do know about reservists psychiatric disorder burden is based on highly localized samples [10]. As previous civilian studies have documented that mental disorder prevalence varies by state, a nation-wide sample of Reserve and National Guard service members is needed to estimate incidence rates in this population.

We aimed to determine incidence and recurrence rates of PTSD and depression in a population-based cohort study of US Reserve and National Guard service members. To this end, we used the Reserve National Guard (RNG) study to document first incidence rates of PTSD and depression, and their predictors.

Material and methods

Study population

Launched in 2009, the RNG study was a 4-year prospective cohort study that aimed to collect and evaluate population-based data on psychiatric health in the reserve component. To obtain a nationally representative sample of reservists, a stratified random sample was selected in two distinct phases. First, the Defense Manpower Data Center provided a random sample of Reserve ($n = 10{,}000$) and National Guard ($n = 10{,}000$) soldiers serving as of June 2009. Second, we selected a random sample of 9751 service members (4788 National Guard; 4963 Reserve) and mailed information about the study along with an opt-out letter and 1097 opted-out. Next, we excluded 2866 with incorrect and/or nonworking telephone numbers, 385 who were not eligible (e.g., hearing problem, retired), 1097 who did not wish to participate, 14 who only completed pilot surveys, and 3386 who had not yet been contacted when we reached our target sample size ($n \geq 2000$; Fig. 1). A total of 2003 Reserve and National Guard service members were interviewed at baseline (January–July 2010). Using American Association for Public Opinion Research definitions [11], the overall cooperation rate was 68.2%, and the response rate was 34.1%; both rates are comparable to other population-based military cohort studies, such as Army STARRS (65.1% and 49.8%, respectively; 8). Complex survey weights were constructed to account for sampling design, demographic factors associated with baseline nonresponse, and poststratification adjustments based on the characteristics of the entire population at time of sampling in 2009. Weights for waves 2, 3, and 4 were adjusted for follow-up interview nonresponse. A more detailed description of the RNG study and weighting procedures is presented elsewhere [12].

Study procedures and measures

Study-trained interviewers obtained informed consent, administered a 60-minute telephone interview using computer-assisted telephone interview technology, and offered $25 compensation. The Human Research Protection Office at the US Army Medical Research and Materiel Command and institutional review boards at both Columbia University and Uniformed Service University of the Health Sciences approved all study protocols.

Assessment of post-traumatic stress disorder

The PTSD Checklist (PCL-C) [13] is a 17-item measure that is validated to assess the severity of symptoms related to any lifetime stressor (i.e., self-selected "worst" trauma experienced), which maps onto the 17 Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) symptoms. Although the PCL is structured to solicit past-month symptoms, we asked participants to answer with respect to lifetime symptoms they experienced at baseline and past-year symptoms at each subsequent wave. In a similar sample of National Guard soldiers [14], past-year telephone diagnosis of PTSD using the PCL was found to have moderate sensitivity (0.54) and high specificity (0.92) and negative predictive value (0.97) compared to the "gold standard" Clinician-Administered PTSD Scale [15].

The PCL was administered to participants endorsing any of the traumatic experiences in the traumatic events questionnaire. Participants answered a questionnaire to assess potentially traumatic events, first outside the context of their most recent deployment, and then within the context of their most recent deployment. Nondeployment-related traumatic events were assessed using a list compiled from the Life Events Checklist [16] and events from Breslau and colleagues [17]; the deployment-related traumatic events were assessed using that same list, asked in reference to their most recent deployment, and also added items from the Deployment Risk and Resilience Inventory [18]. Participants were offered an opportunity to describe any other traumatic event that was not listed on the two scales. Lifetime traumatic events were asked about at the first wave, whereas subsequent waves asked exclusively about events occurring since the last interview. Any potentially traumatic events that was not related to a respondent's most recent deployment was captured in a single item on the Life Events Checklist that asked whether they had ever "Experienced combat or exposure to a war zone." At the baseline interview, 95% of respondents endorsed $\geq$1 trauma and completed the PCL.

Because of the differences in previously reported diagnostic criteria for PTSD [1], we calculated a sensitive and specific criterion for symptoms. Among participants who experienced a traumatic event, participants were classified dichotomously as having PTSD or not having PTSD symptoms on the sensitive criteria based on DSM-IV criteria alone, whereas the specific criteria required DSM-IV symptoms and a score of 50 or more on the checklist (range: 17–85) [19]. The survey asked respondents to choose their self-reported worst traumatic event and endorse "how much you were ever bothered by each of these problems in relation to this stressful experience." Respondents had to endorse that a symptom bothered them "moderately" or more for it to count as positive toward the diagnosis. To be classified as having PTSD symptoms according to DSM-IV, participants had to endorse $\geq$1 criterion B symptom, $\geq$3 criterion C symptoms, $\geq$2 criterion D symptoms [13]. Criterion A2 was dropped based on the DSM-5 classification criteria statement and recent research in veteran populations indicating the