Is cohesion within military units associated with post-deployment behavioral and mental health outcomes?

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ABSTRACT

Purpose: Prior studies suggest that cohesion among members of military units has a positive impact on behavioral and mental health sequelae of combat deployment. However, these studies have not distinguished variation in cohesion across units from variation in perception of cohesion across individuals within units.

Methods: A sample of U.S. Marines was assessed before and after deployment to Iraq or Afghanistan in 2010 or 2011. Within-group centering was used to distinguish unit-level from individual-level associations of cohesion with four behavioral and mental health outcomes assessed after deployment: alcohol misuse, violation of the Uniform Code of Military Justice (UCMJ), probable posttraumatic stress disorder (PTSD) and a positive screen for depression.

Results: Unit-level cohesion is associated positively with alcohol misuse (OR=1.86, 95% CI 1.05–3.29) and negatively with UCMJ violations (OR=0.41, 95% CI 0.20–0.83) but not with probable PTSD (OR=1.00, 95% CI 0.60–1.6) or a positive screen for depression (OR=1.00 95% CI 0.58–1.72). Lower perception of cohesion relative to the other members of the same unit is associated with higher likelihood of UCMJ violations, probable PTSD and a positive screen for depression.

Limitations: Data on all members of the studied units were not available.

Conclusions: Distinguishing unit-level from individual-level variation in cohesion among military unit members reveals more varied associations with behavioral and mental health outcomes of deployment than have been reported in previous studies, in which these levels have been collapsed. Associations between individual-level variation in cohesion and mental health outcomes may result from pre-existing traits related to both perception of cohesion and risk for psychiatric disorders.

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Since World War I, cohesion among members of combat units has been thought to have a positive impact on the mental health of combatants during and after combat deployment (Shephard, 2004; Wessely, 2006). Cohesion is thought to promote positive morale among unit members, who, with a strong sense of purpose and comradeship, have greater resilience in the face of the enormous stresses of war (Bartone, 2006; Shils and Janowitz, 1948). Recent research appears to support this theory by demonstrating negative associations of cohesion, measured by reports of the mutual support that unit members provide one another (Griffith, 2007), with psychological problems, including symptoms of posttraumatic stress disorder (Brailey et al., 2007; Dickstein et al., 2010; Du Preez et al., 2012; Jones et al., 2012; Kanesarajah et al., 2016; McTeague et al., 2004; Pietrzak et al., 2010; Whybrow et al., 2015), depression (Bryan and Heron, 2015), and psychological

distress (Du Preez et al., 2012; Jones et al., 2012; Kanesarajah et al., 2016; Mulligan et al., 2010; Whybrow et al., 2015). Cohesion is of particular interest to military psychiatry because of the possibility that it is modifiable through improvements in leadership practice (Britt and Oliver, 2013). These findings are also of more general interest because of their implications regarding modification of the impact of traumatic and other adverse events by the social context in which they are experienced (Pietrzak et al., 2010).

A limitation of previous studies is that they have examined associations of cohesion with mental health and behavioral outcomes without distinguishing between variation across units, i.e. comparing units with high and low levels of cohesion, and variation across individuals, i.e. comparing individuals within a unit who perceive the unit's cohesion as high or low. This is a significant limitation, given that the underlying theory clearly specifies that cohesion is a characteristic of units (Griffith, 2002), not of individual members. Failing to distinguish unit cohesion from individuals' perception of cohesion in relation to mental health

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outcomes may be misleading because of the potential confounding that may arise from the correlation between an individual's mental health and their perceptions of cohesion. Pre-existing mental health problems may lead individuals with poor mental health to perceive less cohesion in their unit, relative to other members of the same unit. Given that pre-existing mental health problems are known to predict post-deployment mental health outcomes (DiGangi et al., 2013; Warner et al., 2011b), the perception of low cohesion by members with pre-deployment problems would result in spurious associations between cohesion and post deployment problems. Cohesion has been examined as a unit characteristic in studies of operational performance (Oliver et al., 1999), and well-being (Griffith, 2002), but not in any prior studies of behavioral or mental health outcomes of deployment.

In this study we use within-group centering (van de Pol and Wright, 2009) to test the hypothesized relationship of unit level cohesion with mental health and behavioral outcomes while taking account of individual, within-unit, variations in cohesion ratings. The data come from a longitudinal study of U.S. Marines who deployed to Iraq or Afghanistan in 2010 or 2011. In addition, while prior studies have examined cross-sectional relationships, the longitudinal design of this study allows us to account for baseline differences in behavior and mental health.

1. Methods

1.1. Study design and sample selection

Data come from the evaluation of a Marine Corps program called Operational Stress Control and Readiness (OSCAR), which trains Marine officers and non-commissioned officers (NCOs) to recognize signs of stress in Marines under their command and, where appropriate, to intervene early to prevent and treat mental health problems (Vaughan, 2015). The evaluation was a quasi-experimental, longitudinal study in which surveys were administered prior to (T1) and after deployment (T2) to Marines in battalions with and without OSCAR-trained teams.

Study participants were selected through a two-stage sampling procedure that consisted of (1) sampling eligible battalions, which included active-duty or reserve units preparing for a combat deployment to Iraq or Afghanistan in 2010 or 2011, and (2) sampling companies within each of the selected battalions. 2975 Marines of rank O6 (colonel) or lower within the sampled companies were known to have had the opportunity to complete the T1 survey. Of these Marines, 2620 (88%) completed the T1 survey, of which 2523 Marines subsequently deployed to Iraq or Afghanistan and were eligible for inclusion in this analysis. Roughly half of the 2523 eligible Marines who completed the T1 survey (51.8%) also completed the T2 survey, resulting in a final sample size of 1307. Only a small percentage of T1 survey completers explicitly refused to complete the T2 survey (n=194, 7.7%). Rather, most Marines who did not complete the T2 survey could not be located after redeployment because of permanent change of station (PCS) or end of active service (EAS).

To assess the possible impact of attrition on the final sample composition, we conducted cluster-adjusted Wald chi-square tests of significance to compare the T2 survey completers (N=1307) and non-completers (n=1216) on all of the sociodemographic and service history characteristics and baseline levels of the outcomes of interest measured in the T1 survey. The two groups differed significantly only in that Marines who did not complete the T2 survey were more likely to have children and to have deployed previously to Iraq or Afghanistan at least once.

1.2. Procedures

Data collection took place between March 2010 and October 2012. Prior to deployment (T1), pencil-and-paper self-report surveys were administered in a group setting on base by a survey administrator outside the chain of command. The amount of time between the dates of the T1 survey administration and deployment varied across battalions, with an average of 61.1 days (SD=46.8 days) between these dates (minimum: 13 days; maximum: 6.5 months). After the T1 survey participants returned from deployment, which typically lasted seven months, the T2 survey was administered in a group setting on base. The targeted length of time between the dates of redeployment and the T2 survey administration was 2-3 months. However, due to difficulty scheduling the survey administration on-base, the actual time lag varied considerably across battalions with an average of 92.2 days (SD=3.4 months) and a range of four days to 17.5 months. Study procedures were approved by the RAND Human Subjects Protection Committee and the Department of Defense.

1.3. Measures

1.3.1. Unit cohesion

Marines' perceptions of the supportiveness of the military in general, unit leaders, and other unit members were assessed in the T1 and T2 surveys with the 12-item Deployment Social Support subscale of the Deployment Risk and Resilience Inventory (DRRI) (King et al., 2006). Example items include "My unit is like family to me" and "I am supported by the Marine Corps." Each item was rated on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). Composite scale scores were computed as the mean of item ratings. This scale has excellent internal consistency reliability in previous research (Cronbach's alpha=0.91, 0.94) (King et al., 2006). In the current study, internal consistency was excellent in the T1 survey (Cronbach's alpha=0.93) and T2 survey (Cronbach's alpha=0.94).

Scores on the DRRI were used to construct measures of unit cohesion, defined as the average of DRRI score across all unit members in the sample, and individual perceptions of cohesion, defined as the deviation of each individual's DRRI score from their unit's mean.

1.3.2. High-risk alcohol use

The AUDIT-C (Bush et al., 1998) was used to screen for high-risk alcohol use in both the T1 and T2 surveys. This is a three-item measure that queries respondents about their frequency and quantity of alcohol consumption in the past year. Possible scores range from 0 to 12, with higher scores indicating greater likelihood that the respondent's drinking is affecting his or her health and safety. Based on the Department of Veterans Affairs/DoD guidelines for management of substance use disorders, which recommend a referral to specialty care for substance use disorders for anyone with a score of 8 or higher on the AUDIT-C (Department of Veterans Affairs and Department of Defense, 2009), we used a cutoff score of 8 or higher to categorize participants' self-reported drinking behavior as high risk. This cut score has been shown to have a sensitivity of 0.54 and specificity of 0.94 in the detection of alcohol dependence in previous research (Dawson et al., 2005). Internal consistency for the AUDIT-C was good at both time points (T1 survey: Cronbach's alpha=0.87; T2 survey: Cronbach's alpha=0.86).

1.3.3. Uniformed code of military justice (UCMJ) violation

Respondents were asked whether they had been "formally charged with any violation of the Uniformed Code of Military Justice (UCMJ) in the past six months." The UCMJ outlines military