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Risk factors for relapse to problem drinking among current and former US military personnel: A prospective study of the Millennium Cohort☆

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ABSTRACT

Background: Military service members may be prone to relapse to problem drinking after remission, given a culture of alcohol use as a coping mechanism for stressful or traumatic events associated with military duties or exposures. However, the prevalence and correlates of relapse are unknown. We sought to identify socio-demographic, military, behavioral, and health characteristics associated with relapse among current and former military members with remittent problem drinking.
Methods: Participants in the longitudinal Millennium Cohort Study who reported problem drinking at baseline (2001–2003) and were remittent at first follow-up (2004–2006) were included ($n = 6909$). Logistic regression models identified demographic, military service, behavioral, and health characteristics that predicted relapse (report of ≥1 past-year alcohol-related problem on the validated Patient Health Questionnaire) at the second follow-up (2007–2008).
Results: Sixteen percent of those with remittent problem drinking relapsed. Reserve/National Guard members compared with active-duty members (odds ratio [OR] = 1.71, 95% confidence interval [CI]: 1.45–2.01), members separated from the military during follow-up (OR = 1.46, 95% CI: 1.16–1.83), and deployers who reported combat exposure (OR = 1.32, 95% CI: 1.07–1.62, relative to non-deployers) were significantly more likely to relapse. Those with multiple deployments were significantly less likely to relapse (OR = 0.73, 95% CI: 0.58–0.92). Behavioral factors and mental health conditions also predicted relapse.
Conclusion: Relapse was common and associated with military and non-military factors. Targeted intervention to prevent relapse may be indicated for military personnel in particular subgroups, such as Reservists, veterans, and those who deploy with combat exposure.

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1. Introduction

Alcohol use is the third-greatest contributor to morbidity and mortality in the United States (Mokdad et al., 2004) and comes at enormous cost to society (Harwood et al., 1998, 2009). While many people drink alcohol at healthy levels, approximately 9% drink at levels that result in the development of problems (e.g., familial or legal problems; Grant et al., 2004). Once people drink at these levels, they often have a hard time changing despite experiencing resultant problems. While some people with problem drinking can resolve problems with or without stopping all use, many cannot (Dawson et al., 2007; National Center on Addiction and Substance Abuse, 2012) Therefore, problem drinking can be considered a chronic condition (McLellan et al., 2000) that relapses and remits such that people move in and out of problem drinking separated by intervals of abstinence, risky drinking, or use at recommended levels (Dawson et al., 2007; Vaillant, 1983; Vaillant and Milofsky, 1982).

Multiple studies have described high rates of problem drinking among military service members (Armed Forces Surveillance Center, 2013; Bray et al., 2013, 2010; Clarke-Walper et al., 2013; Heltemes et al., 2013; Institute of Medicine, 2012; Jacobson et al., 2008; Stahre et al., 2009). Problem drinking may be particularly costly in this population due to associated decreased work performance (Blume et al., 2010; Frone, 2006; Harwood et al., 2009), impaired athletic performance (O'Brien and Lyons, 2000), increased risk of injury (Harris et al., 2009; Williams et al., 2012) and comorbid mental health disorders (Bray et al., 2010; LeardMann et al., 2013),and multiple other adverse health outcomes including sleep deprivation and fatigue (Lamond and Dawson, 1999; Roth and Roehrs, 1996) that may lead to performance impairment (Harwood et al., 2009; Institute of Medicine, 2012). The costs of alcohol use to the Department of Defense (DoD) were recently estimated at $425 million per year (Dall et al., 2007; Institute of Medicine, 2012).

Military service members may be prone to relapse after previous recovery periods, given a culture of alcohol use as a coping mechanism for stressful or traumatic events associated with military duties or combat exposure (Ames and Cunradi, 2004; Ames et al., 2007, 2009; Institute of Medicine, 2012). However, the prevalence and unique predictors of relapse are unknown in military personnel for whom the experiences within the military may significantly influence relapse (Ames et al., 2007).

We sought to describe the prevalence of relapse to problem drinking, as well as to identify sociodemographic, military, behavioral, and health characteristics associated with relapse, among current and former military members with remittent problem drinking in a large, prospective study of US military service members who participated in The Millennium Cohort Study.

2. Methods

2.1. Study population and data sources

The Millennium Cohort Study commenced prior to September 11, 2001, and consists of four recruitment panels that are surveyed approximately every 3 years. The present study utilized data from the first recruitment panel, a weighted sample of active duty and Reserve/National Guard personnel serving in the military as of October 2000. Personnel deployed to Southwest Asia, Bosnia, and Kosovo from 1998 to 2000, Reservists, and women were oversampled. Informed consent was obtained from all participants. Detailed description of the sampling and methodology has been previously published (Ryan et al., 2007; Smith et al., 2007). This study was reviewed and approved by IRBs at the Naval Health Research Center and VA Puget Sound.

Data sources included questionnaires and official military records. Electronic military personnel files provided by the Defense Manpower Data Center (DMDC) contained sociodemographic, military service, and employment characteristics. Behavioral metrics and military exposures, including alcohol use and combat experience, were obtained from the questionnaires.

Inclusion and exclusion criteria: Of the 77,047 participants (36% of those initially contacted; Ryan et al., 2007) enrolled in the first panel, 46,437 participants completed a baseline questionnaire (Wave 1) and two consecutive follow-up surveys (Wave 2: 2004–2006 and Wave 3: 2007–2008). The baseline Millennium Cohort survey instrument included a skip pattern such that participants who did not endorse drinking more than 12 alcohol beverages in the last year were asked to skip the remaining alcohol-related questions. Therefore, completion of all three surveys as well as report of drinking more than 12 alcoholic beverages in the last year were considered initial inclusion criteria. Participants additionally had to (1) respond to questions pertaining to "problem drinking" at baseline, (2) be in remittance from problem drinking at Wave 2 and thus at risk for relapse, and (3) have complete data on exposures and problem drinking status in order to be eligible for this study (Fig. 1). There were 6909 participants who met these criteria.

2.2. Problem drinking

Baseline problem drinking was assessed using the lifetime version of the CAGE questionnaire (Ewing, 1984; Have you ever felt the need to cut down your drinking, felt annoyed by criticism of your drinking, had guilty feelings about drinking, taken a morning eye opener?) and the PRIME-MD Patient Health Questionnaire (PHQ), which assesses five alcohol-related consequences occurring more than once during the last 12 months (Spitzer et al., 1999). PHQ alcohol-related items include (1) drinking alcohol even though a doctor suggested stopping because of health problems; (2) being high from alcohol or hung over while working, being in school, or taking care of children; (3) missing or being late for work, school, or other activities because of drinking; (4) having problems getting along with people while drinking; and (5) driving a car after having several drinks or after drinking too much. Baseline problem drinking was defined as endorsement of one or more items from either the CAGE or PHQ. Remittent problem drinking was defined based on non-endorsement of any PHQ item at the Wave 2 survey. The study outcome, relapse to problem drinking, was defined based on endorsement of any PHQ item at Wave 3. The CAGE was not used to define problem drinking at Waves 2 or 3 due to its lifetime time frame.

2.3. Exposures

Demographic characteristics: Demographic characteristics included sex, age (17–24, 25–34, 35–44, and >44 years), marital status (never married, married, divorced or widowed), education (some college or less, bachelor's degree or higher), and self-reported race/ethnicity (white non-Hispanic, black non-Hispanic, Hispanic, and other). Asian and Native American participants, as well as those of unknown race, were included in the "Other" group due to small numbers. All characteristics except marital status were obtained at baseline; marital status was obtained at Wave 2 because it may vary over time.

Military service characteristics: Military characteristics included service branch (Army, Navy/Coast Guard, Marine Corps, Air Force), service component (active duty, Reserve/National Guard), occupation (combat specialist, health care, other) and pay grade (junior enlisted [E00–E05], senior enlisted [E06–E09], officer [warrant and enlisted]). Deployment experience was obtained between Waves 1 and 2 and categorized as no deployment, deployment without combat exposure, and deployment with combat exposure. Combat exposure was assessed using 5 items that asked "over the past 3 years" whether respondents had personally: (1) witnessed a death due to war, disaster, or tragic event; (2) witnessed instances of physical abuse; (3) exposed to dead or decomposing bodies; (4) exposed to maimed soldiers or civilians; or (5) exposed to prisoners of war or refugees. Endorsement of any item was combined with deployment dates to identify deployment with combat exposure. Deployment to Southwest Asia, Bosnia or Kosovo before 2000 (yes/no), multiple deployments (yes/no), and military separation during 2001–2008 were evaluated using DMDC data.

Behavioral factors: Three behavioral factors were measured at Wave 2. Smoking status was categorized into non-smoker, past smoker, or current smoker. Non-smokers reported never having smoked 100 cigarettes at Wave 1 and Wave 2 surveys. Current smokers reported smoking 100 cigarettes ever and had not tried or had been unsuccessful at quitting at Wave 2. Past smokers reported smoking 100 cigarettes ever and having successfully quit at consecutive waves (1 and 2) or at Wave 2. Drinking status at Wave 2 was defined based on past-week and past-year items measuring the quantity and frequency of average drinking and the frequency of heavy episodic (or "binge") drinking reported at Wave 2. Abstinence was defined as reporting zero drinks in the last week and never binge drinking ($\geq$5 and $\geq$4 drinks/day for men and women, respectively, on a single occasion) in the last year. Low-risk drinking was defined as alcohol use within national recommended weekly limits (National Institute on Alcohol Abuse and Alcoholism, 2007; $\leq$7 drinks for women and $\leq$14 drinks for men) and no report of binge drinking. Risky drinking was defined as exceeding the recommended weekly or daily limits, or any binge drinking in the last year (Smith et al., 2009). Trouble sleeping was defined based on a response of "moderately" or "greatly" to the question "In the past month, have you had trouble falling asleep or staying asleep?" on the Posttraumatic Stress Disorder (PTSD) Checklist-Civilian Version (PCL-C); or a response of "several days or longer" to the question "Over the last 4 weeks, how often have you experienced trouble falling asleep or staying asleep?" on the PHQ.

Mental health conditions: Depression, anxiety, and panic disorders were assessed at Wave 2 using the PHQ, based on *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) criteria (Kroenke et al., 2001; Spitzer et al., 1999).