Short Communication

Insomnia moderates the association between alcohol use and consequences among young adult veterans

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HIGHLIGHTS

- Approximately two out of three participants screened positive for insomnia.
- Insomnia was associated with increased risk of alcohol problems.
- Drinking was associated with more problems for those with positive insomnia screens.
- Insomnia may be an appropriate target for alcohol prevention and intervention.

ARTICLE INFO

ABSTRACT

Objective: Symptoms of insomnia and heavy alcohol use tend to co-occur among military and veteran samples. The current study examined insomnia as a moderator of the association between alcohol use and related consequences among young adult veterans in an effort to extend and replicate findings observed in samples of civilian young adults.

Method: Young adult veterans (N = 622; 83% male; age M = 29.0, SD = 3.4) reporting alcohol use in the past year completed measures of insomnia severity, alcohol use, and alcohol-related consequences as part of a larger intervention trial. Participants were classified as screening 'positive' (n = 383, 62%) or 'negative' (n = 239, 38%) for insomnia using the Insomnia Severity Index. Hierarchical regression was used to examine the interaction between drinking quantity and insomnia on alcohol-related consequences. Predictor and outcome variables were measured concurrently.

Results: Both a greater number of drinks per week and a positive insomnia screen were associated with more alcohol-related consequences. Drinks per week and insomnia screen interacted to predict alcohol-related consequences, such that the effect of drinking on alcohol-related consequences was stronger in the context of a positive versus negative insomnia screen.

Conclusion: Drinking is associated with more alcohol-related consequences in the presence of clinically significant insomnia symptoms. These findings replicate those documented in civilian young adults and indicate that insomnia may be an appropriate target for alcohol prevention and intervention efforts among young adult veterans.

1. Introduction

Heavy alcohol use is prevalent among military and veteran populations. Nearly half (47%) of active duty women/men report four/five or more drinks on one occasion in the past month, and approximately 20% report heavy episodic drinking every week (Bray, Brown, & Williams, 2013). These forms of heavy drinking place military personnel at risk for negative consequences ranging from general stress

to suicidal ideation (Barlas, Higgins, Pflieger, & Diecker, 2013) and may be particularly problematic for those in young adulthood, which has been proposed as a critical period in the development of alcohol use disorders among military personnel (Fink et al., 2016).

Notably, two out of five U.S. Army soldiers returning from Iraq or Afghanistan report heavy drinking in the context of poor sleep health (Swinkels, Ulmer, Beckham, Buse, & Calhoun, 2013). Specifically, 71.5% report difficulty falling or staying asleep and 72.3% report fewer

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than seven hours of sleep per night (Swinkels et al., 2013). Such sleep disturbances have been associated with increased odds of alcohol use and related problems among military personnel and veterans (Luxton et al., 2011; Swinkels et al., 2013; Williams et al., 2015). While the precise mechanisms underlying these associations are unclear, evidence suggests that chronic sleep restriction (which is functionally similar to the sleep patterns of individuals with insomnia) leads to deficits in attention and working memory (Alhola & Polo-Kantola, 2007; Benitez & Gunstad, 2012; Fortier-Brochu & Morin, 2014), which may then lead to a greater propensity for poor decision-making and increased risk of alcohol problems. In support of this hypothesis, the combination of alcohol use and poor sleep quality has been associated with elevations in alcohol-related problems among college students who drink (Kenney, LaBrie, Hummer, & Pham, 2012; Miller, DiBello, Lust, Carey, & Carey, 2016).

The current study aimed to extend previous research by examining the interactive effects of alcohol use and insomnia symptoms among young adult veterans. Consistent with research among college students (Kenney et al., 2012; Miller, DiBello, et al., 2016), we hypothesized that insomnia would moderate the association between alcohol use and consequences, such that drinking quantity would be associated with more alcohol-related consequences in the context of insomnia. To isolate the contribution of insomnia to alcohol use outcomes, we controlled for symptoms of depression and PTSD, which have been associated with alcohol use in this population (Fuehrlein et al., 2014; Williams et al., 2015). Results of this study are expected to inform intervention efforts for young adult veterans by identifying behavioral patterns that increase risk of alcohol problems.

2. Materials and methods

2.1. Participants and procedure

Participants were young adults aged 18 to 34 years who were recruited using targeted Facebook ads as part of a larger randomized controlled trial (Pedersen, Parast, Marshall, Schell, & Neighbors, 2017). Eligibility criteria included (a) being a U.S. veteran currently separated from active duty, (b) being between ages 18 to 34 years, and (c) scoring 3/4 + (for women/men) on the Alcohol Use Disorders Identification Test (Saunders, Aasland, Babor, de la Fuente, & Grant, 1993). Overall, 784 past-year drinkers completed the baseline survey online from remote locations and were randomized to either the online intervention ($n = 388$) or an attention control condition ($n = 396$). A total of 622 participants (79% follow-up rate) completed the one-month follow-up survey online and were included in analyses for this study. Details regarding recruitment procedures, sample characteristics, and intervention outcomes have been published elsewhere (Pedersen, Naranjo, & Marshall, 2017; Pedersen, Parast, et al., 2017). All procedures were approved by the institutional review board.

2.2. Measures

2.2.1. Demographic information

Participants responded to questions regarding their age, gender, race, ethnicity, and branch of service at baseline. An 11-item scale was used to assess combat exposure and severity (Schell & Marshall, 2008). Participants responded (*yes/no*) if they had been exposed to combat during deployment. They then indicated (*yes/no*) if they had experienced each of 11 potential combat situations (e.g., "engaging in hand-to-hand combat"). Responses were summed to indicate combat severity, with possible total scores ranging from 0 to 11.

2.2.2. Posttraumatic stress disorder (PTSD) screen

Participants completed the 20-item PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013) at baseline and one-month follow-up, indicating the extent to which they had been bothered by symptoms such

as "trouble remembering important parts" of a stressful experience in the past month. Response options ranged from 0 (*not at all*) to 4 (*extremely*), with possible total scores ranging from 0 to 80. Participants scoring ≥ 33 (Bovin et al., 2015) were classified as screening positive for PTSD. The PCL-5 has demonstrated good reliability and convergent and divergent validity in samples of veterans (Bovin et al., 2016), and reliability in this sample was high (α = 0.98).

2.2.3. Depression screen

Participants self-reported symptoms of depression on the Patient Health Questionnaire-8 (PHQ-8; Kroenke et al., 2009) at baseline and one-month follow-up. Specifically, they indicated how frequently in the past two weeks they had been bothered by symptoms such as "poor appetite or overeating." Response options ranged from 0 (*not at all*) to 3 (*nearly every day*), with possible total scores ranging from 0 to 24. Participants scoring ≥ 10 (Kroenke et al., 2009) were classified as screening positive for depression. Internal consistency of items in this sample was high (α = 0.93).

2.2.4. Drinks per week

Participants reported their drinking quantity in a typical week at baseline and follow-up using the Daily Drinking Questionnaire (Collins, Parks, & Marlatt, 1985). On a seven-day grid, they indicated how many drinks they had consumed on each day of a typical week in the past month. Responses were summed to calculate drinks per week.

2.2.5. Insomnia screen

Participants reported symptoms of insomnia only at one-month follow-up. The Insomnia Severity Index (Morin, Belleville, Belanger, & Ivers, 2011) was used to assess insomnia severity in the past two weeks. Seven items assessed difficulty falling or staying asleep, satisfaction with current sleep pattern, interference with daily functioning, the extent to which others notice their sleep problems, and worry/distress related to sleep problems. Response options ranged from 0 (e.g., *not at all worried*) to 4 (e.g., *very much worried*), with possible total scores ranging from 0 to 28. Participants scoring ≥ 10 were classified as screening positive for insomnia (Morin et al., 2011). Reliability of items in this sample was high (α = 0.93).

2.2.6. Alcohol-related consequences

The 24-item Brief Young Adult Alcohol Consequences Questionnaire (Kahler, Hustad, Barnett, Strong, & Borsari, 2008; Kahler, Strong, & Read, 2005) was used to estimate the number of alcohol-related consequences participants had experienced in the past 30 days both at baseline and follow-up. Participants indicated (*yes/no*) if they had experienced consequences such as saying/doing embarrassing things, taking foolish risks, drinking on nights they had planned not to drink, and passing out from drinking in the past month. Possible total scores ranged from 0 to 24. This measure has been used widely in studies of young adult drinking behavior, in college student (Merrill, Read, & Barnett, 2013), non-student (Lau-Barraco, Braitman, Stamates, & Linden-Carmichael, 2016), and military samples (Miller, Brett, et al., 2016; Pedersen, Parast, et al., 2017). Internal consistency in this sample was high (α = 0.94).

2.3. Data screening and analysis

All measures and data collected for the present analyses utilized cross-sectional data from the one-month follow-up survey. Data were screened for missing values, normality, and baseline differences between intervention and control conditions prior to analysis. Two participants were missing one-month data on drinks per week and insomnia variables; thus, these individuals were dropped from analyses. Skewness and kurtosis estimates for predictor and outcome variables were within the acceptable range (Tabachnick & Fidell, 2007). At baseline, there were no significant differences between groups in age,