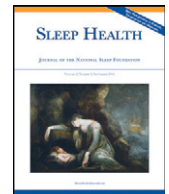




Contents lists available at ScienceDirect

Sleep Health

Journal of the National Sleep Foundation

journal homepage: sleephealthjournal.org

The association between acute stress-related insomnia and alcohol use

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ARTICLE INFO

Article history:

Received 26 June 2015

Received in revised form 11 May 2016

Accepted 20 June 2016

ABSTRACT

Objectives: Despite contributing greatly to overall sleep disturbance, individuals suffering from sleep disorders, such as insomnia, may use alcohol because of a widely-held misconception that it will improve overall sleep quality and quantity. The purpose of this study was to examine the relationship between the motivations for drinking alcohol and acute stress-related insomnia.

Methods: Participants were 191 healthy individuals who were asked to complete an online questionnaire about stress-related insomnia, alcohol consumption, and motivations for drinking alcohol.

Results: Results revealed that individuals high in acute stress-related insomnia reported higher scores on measures of problem drinking behaviors and were more likely to report using alcohol as a means of reducing stress and facilitating sleep despite no difference in consumption rates.

Conclusions: These findings represent an important factor for clinicians to consider when dealing with individuals reporting acute stress-related insomnia, particularly given the overall negative impact of alcohol on sleep quantity and quality, which may lead to an exacerbation of stress and insomnia.

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Insomnia is the most common sleep-related disorder and has a prevalence rate from 9.5% to 16.6% in adult populations.^{1–3} It is characterized by difficulty falling asleep and difficulty staying asleep, and it has negative effects on personal health, job performance, interpersonal relationships, and academic performance.⁴ It appears that chronic insomnia may initially occur as the result of a trait vulnerability to stress-related sleep disturbance.^{5–7} Individuals who possess this trait vulnerability have an increased susceptibility to the negative effects of stressors and hyperarousal on sleep.⁵ These individuals are more likely to experience diminished sleep quality and quantity as a result of stressful events (ie, sleep reactivity). For example, an individual with stress-related sleep disturbance is likely to have difficulty falling asleep immediately after an intense argument because this is a particularly stressful event.⁶ Although acute stress-related insomnia does not necessarily indicate that an individual has chronic insomnia—given that some healthy sleepers may possess this trait vulnerability yet not experience insomnia because of a limited exposure to stress⁸—increased sleep reactivity to stress is predictive of the development of insomnia.⁹ The concept of stress reactivity is consistent with the diathesis-stress, or “3P,” model of insomnia.¹⁰ Within

this model, stressful events (precipitating factors) are hypothesized to induce periods of difficulty initiating or maintaining sleep, with each individual having a personal “insomnia threshold” or predisposing susceptibility to sleep disturbances.

Insomnia appears to be a significant clinical issue in adolescents and young adults, reaching prevalence rates of approximately 13.6%.⁴ This has in part been attributed to a higher frequency of irregular sleep patterns in this population; however, recent work has suggested that adolescent insomnia may arise from a mismatch between regular academic schedules and a postpubertal shift to preferred later sleep times.^{11,12} Current research suggests that insomnia in adolescents is a significant risk factor for psychological problems in adulthood¹³ and disrupts neural reward mechanisms.¹⁴ Therefore, research into the causes and interventions for this disorder is a major priority. Of particular concern is the rapidly increasing abuse of legal and illegal substances within this population. Prevalence rates of alcohol use and the use of illegal drugs peak during adolescence and early adulthood.¹⁵ Even more alarming is the frequency of adolescents and young adults using substances to reduce psychological stress and ease anxiety.^{16,17} Individuals faced with recurrent stressful experiences may resort to substances to temporarily reduce psychological pain or forget troubling events. Adolescents who suffer from insomnia are significantly more likely to use alcohol, cigarettes, and other illicit drugs.¹⁸ Because stress typically disrupts sleep,

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individuals may also use substances to facilitate sleep. Alcohol is a particularly commonly used drug, and it is estimated that 20% of individuals with chronic insomnia report using alcohol to improve sleep.¹⁹ However, research on the physiological and psychological effects of alcohol on sleep suggests that it may do more harm than good. Indeed, it has been reported that those individuals with poorer sleep quality and higher coping motives for alcohol use (eg, to forget troubling events) tend to also experience worse alcohol-related consequences.²⁰

Alcohol and sleep

The effects of alcohol consumption on sleep have been widely explored. Although alcohol use is associated with an initial reduction of sleep onset latency, it is also positively correlated with difficulty maintaining sleep and subjectively insufficient sleep quality.^{21,22} This is due in part to the biphasic effects of alcohol. Following initial consumption, as blood alcohol levels rise to moderate levels, alcohol has initial stimulant effects that progress to sedative effects.²³ In middle-aged adults, alcohol may initially promote sleep by depressing neural activity due to the sedating effects of ethanol; however, several of the metabolites of ethanol appear to have stimulating properties, which may disrupt sleep.²⁴ Adolescents and young adults, however, appear to be less sensitive to the sedating effects alcohol; the consumption of alcohol in the evening (at low or moderate doses) may prolong sleep latency due to a reduction of sedating effects and consequent exaggeration of stimulant effects,^{25,26} in addition to the later disruption of sleep and wakefulness during the night following alcohol consumption.²⁷ This finding is especially problematic in adolescent populations who are already at risk for developing sleep-related disorders due to developmental circadian shifts.²⁸

It is clear that alcohol use is related to impaired sleep quality and quantity and that alcohol consumption can trigger insomnia and/or exacerbate its symptoms, particularly in adolescents and young adults. However, it is not currently understood how alcohol use is related to acute stress-related insomnia. Whereas those with chronic insomnia tend to experience sleep disturbance on a regular basis regardless of environmental influences, those with stress-related insomnia experience sleep disturbance only as a result of stress. Therefore, alcohol may interact differently for individuals with this particular vulnerability. In addition, it is possible that those with acute stress-related insomnia may have different motivations regarding alcohol consumption.

The current study

The purpose of the current study is to examine how alcohol consumption is associated with the degree of acute stress-related insomnia in a healthy population. As mentioned earlier, individuals may use alcohol to reduce psychological stress, as alcohol is often thought of by the public as having sleep-inducing and stress-reducing qualities. We hypothesized that participants with a greater degree of acute stress-related insomnia would be more likely to report consuming alcohol as a means of reducing stress and facilitating sleep. To our knowledge, no previous studies have attempted to examine the associations between alcohol use and acute stress-related insomnia. Given the broad range of our sample, our hypotheses were assessed in both the entire sample as well as a subset representing a more traditional undergraduate population. This information may be useful for identifying young adults who may be at risk of downstream alcohol use disorders and/or chronic insomnia with associated complications.

Participants and methods

Participants

Data were collected from 191 individuals. Participants were 26 male and 165 female undergraduate students in Eastern Canada. Participants ranged from 18 to 57 years old with a mean age of 22.25 and standard deviation of 6.56. Mean hours of sleep per night were 6.8 (SD = 1.33). A subanalysis focusing on a more traditional undergraduate cohort examined the variables of interest only in those participants between 18 and 29 years of age.

Materials

We used several self-reports to measure our variables of interest. The Ford Insomnia Response to Stress Test (FIRST)⁶ is a 9-item scale that measures the self-reported level of stress-related insomnia. Each item contains a 4-point Likert scale upon which participants must indicate the likelihood of experiencing difficulty sleeping for a particular situation (ie, “before having to speak in public”). Whereas individuals with insomnia typically score highly on this scale, the purpose is not to diagnose or identify insomniacs but rather to determine whether the individual possesses a vulnerability to stress-related sleep disturbance. This scale has been shown to have high internal consistency (Cronbach α = .83) and a test-retest reliability of .92.⁵

To measure self-reported alcohol use and abuse, we used the Alcohol Use Disorders Identification Test (AUDIT).²⁹ This 10-item self-report scale is designed to identify individuals with hazardous patterns of alcohol use and has been used previously as a measure of problem drinking behaviors in undergraduate students.³⁰ A score of 8 or higher on this scale indicates problem drinking. This scale has been shown to be highly reliable, with a test-retest coefficient of .92 and a Cronbach α of more than .80.³¹ Apart from the general AUDIT score, we were also interested in subscale scores, which quantify overall “consumption,” drinking behavior for the purpose of “coping with emotions and symptoms,” as well as drinking behavior for “individual enhancement.”

We also used a modified version of the Reasons for Substance Use in Schizophrenia Scale (ReSUS).³² This 38-item self-report scale can be adapted for assessing and determining the reasons for using most commonly used drugs and in this instance was adapted to probe motivations for alcohol use. Questions on this scale consist of a Likert scale ranging from 1 (“never”) to 4 (“always”). This questionnaire contains 3 subscales: (1) coping with distressing emotions and symptoms, (2) social enhancement and intoxication, and (3) individual enhancement; Cronbach α s for the subscales are .91, .81, and .82, respectively. Although this scale was originally developed for use in schizophrenia populations, given the general nature of the questions, it has been used to assess motivations for substance use in nonclinical populations as well.^{33,34}

Procedure

Those who expressed an interest to participate in the study were provided a URL link and asked to complete the online survey at their leisure (albeit within one sitting). They were first asked to read and complete an informed consent form; among the information presented, participants were informed that all data collected were completely anonymous and that there would be no way to trace their responses. Participants were asked demographic information (age and sex), and they were asked to indicate how many hours they sleep on an average night. All participants were asked to complete the FIRST. Participants then completed questionnaires assessing their consumption and motivations for consuming marijuana,

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