



The impact of sleep and psychiatric symptoms on alcohol consequences among young adults



Mary Beth Miller^{a,*}, Eliza Van Reen^{b,c}, David H. Barker^{c,b}, Brandy M. Roane^{b,c,d}, Brian Borsari^e, John E. McGeary^{f,c}, Ronald Seifer^{b,c}, Mary A. Carskadon^{b,c,g}

^a Center for Alcohol and Addiction Studies, Department of Behavioral and Social Sciences, Brown University School of Public Health, Box G-S121-4, Providence, RI 02912, United States

^b Sleep for Science Research Lab, Brown University, 300 Duncan Drive, Providence, RI 02906, United States

^c Department of Psychiatry and Human Behavior, Warren Alpert Medical School of Brown University, 1 Hoppin Street, Coro West Suite 204, Providence, RI 02903, United States

^d University of North Texas Health Science Center, 3500 Camp Bowie Blvd, Fort Worth, TX 76107, United States

^e San Francisco VA Medical Center, 4150 Clement Street, San Francisco, CA 94121, United States

^f Providence VA Medical Center, 830 Chalkstone Ave, Providence, RI 02908, United States

^g School of Psychology, Social Work, and Social Policy, University of South Australia, Adelaide, South Australia, Australia

HIGHLIGHTS

- One in four heavy-drinking college students reports poor sleep quality.
- More than half screen positive for a psychiatric disorder
- Sleep quality and psychiatric symptoms interact in the prediction of alcohol problems.
- Treatment of sleep and psychiatric symptoms may improve alcohol outcomes.

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ABSTRACT

Objective: Independent lines of research have documented links between psychiatric symptoms and poor sleep quality, psychiatric symptoms and alcohol use, and alcohol use and poor sleep quality. The current study examined the synergistic effect of poor sleep quality and psychiatric symptoms on alcohol-related consequences in heavy-drinking young adults.

Method: Matriculating college students reporting at least one heavy drinking episode over the first nine weeks of the semester ($N = 385$, 52% female) were categorized as experiencing 'good' ($n = 280$) versus 'poor' sleep quality ($n = 105$) and screening 'positive' ($n = 203$) or 'negative' ($n = 182$) for a psychiatric disorder. Sleep quality was assessed using the Pittsburgh Sleep Quality Index; psychiatric diagnosis was assessed using the Psychiatric Diagnostic Screening Questionnaire; and alcohol-related consequences were assessed using the Brief Young Adult Alcohol Consequences Questionnaire. General linear models were used to examine the main effects and interaction between sleep quality and psychiatric symptoms on alcohol-related consequences.

Results: Sleep quality moderated the association between psychiatric screen and alcohol-related consequences among heavy-drinking college students, such that psychiatric symptoms were associated with more alcohol-related consequences in the context of poor sleep quality.

Conclusions: The combination of poor sleep quality and psychiatric symptoms is associated with increased alcohol-related consequences among heavy-drinking college students. Given the significant interaction between these symptoms, healthcare providers are encouraged to screen for the presence of sleep and psychiatric disorders among heavy-drinking young adults and to provide empirically-supported treatments as appropriate.

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Alcohol remains the most widely used psychoactive substance among young adults, with 14% of high school seniors consuming five

or more drinks in a row in the past two weeks (Johnston, O'Malley, Miech, Bachman, & Schulenberg, 2015b). This rate of drinking increases substantially as adolescents matriculate to college campuses and universities, where 35% of students report this form of heavy drinking (Johnston, O'Malley, Bachman, Schulenberg, & Miech, 2015a). Heavy drinking in adolescence predicts more frequent occurrence of health

* Corresponding author at: Department of Behavioral and Social Sciences, Center for Alcohol and Addiction Studies, Box G-S121-5, Providence, RI 02912, United States.

E-mail address: millerme04@gmail.com (M.B. Miller).

problems and unsafe health behaviors at 24 years (Oesterle et al., 2004). Thus, prevention of heavy alcohol use among young adults is an ongoing focus of public health efforts.

Poor sleep health (defined broadly as short sleep duration, trouble falling/staying asleep, inconsistent sleep timing, decreased alertness, or poor subjective sleep quality; see Buysse, 2014) has been identified as a risk factor for alcohol-related consequences among young adults. Poor sleep quality, in particular, has been found to moderate the association between alcohol use and related consequences, such that college students reporting worse subjective sleep quality experience more consequences as a result of alcohol consumption (Kenney, LaBrie, Hummer, & Pham, 2012; Miller, DiBello, Lust, Carey, & Carey, 2016). This association occurs not only concurrently but also prospectively, with worse sleep quality predicting more alcohol-related consequences over a five-month period (Miller et al., 2016). Trouble falling/staying asleep at 16–17 years has also been associated with greater alcohol-related problems at ages 21–22 (Wong, Robertson, & Dyson, 2015). Thus, poor sleep health seems to compound young adults' risk for alcohol-related problems, both in the short- and long-term.

Despite consistent associations between sleep and alcohol use in young adults, adolescence and young adulthood are marked by major social and developmental changes that may influence both sleep and alcohol use. Symptoms of psychiatric disorders, in particular, typically emerge between 14 and 24 years (Kessler et al., 2005) and may impact the course and duration of both substance use and sleep disorders. In regards to the association between psychiatric symptoms and alcohol use among college students, symptoms of PTSD have been associated with increased alcohol use (Radomski & Read, 2016), and those with alcohol use disorders have increased odds of mood and anxiety disorders (Dawson, Grant, Stinson, & Chou, 2005). Complex associations also exist between psychiatric symptoms and sleep: while sleep disturbance is often a symptom of psychiatric disorders, changes in sleep may also impact symptom severity and response to treatment (Krystal, 2012). Changes in sleep also seem to impact affective states that may influence the presentation of psychiatric symptoms; specifically, poor sleep quality and shortened sleep duration have been associated with decreased positive affect in adolescents and adults (Bower, Bylisma, Morris, & Rottenberg, 2010; Talbot, McGlinchey, Kaplan, Dahl, & Harvey, 2010) and increased negative affect in response to mild stress (Minkel et al., 2012). Collectively, these data suggest that alcohol use may be associated with symptoms that cut across multiple diagnoses (Roberts, Roberts, & Xing, 2007). Difficulty falling/staying asleep is one symptom that is shared across multiple psychiatric disorders, and therefore may represent a cross-diagnostic risk factor for alcohol-related problems.

While independent associations between psychiatric symptoms, poor sleep quality, and heavy alcohol use have been documented, it is unclear how the synergistic effect of these three factors may impact young people's risk for alcohol-related consequences. National surveys have found that both heavy drinking and psychiatric symptoms predict sleep disturbance among adolescents and young adults (Bruck & Astbury, 2012; Johnson & Breslau, 2001; Popovici & French, 2013; Wong et al., 2015). However, these studies were limited by use of single-item sleep measures and did not assess the joint impact of poor sleep quality and psychiatric symptoms on alcohol-related consequences. In contrast, Kenney, Lac, LaBrie, Hummer, and Pham (2013) found that poor mental health predicted concurrent alcohol-related consequences both directly and indirectly through poor sleep quality. While this model proposes poor sleep quality as a mediator of the association between psychiatric symptoms and alcohol-related consequences, it is also possible that poor sleep quality moderates this association by compounding the negative impact of psychiatric symptoms on alcohol-related consequences.

This study examined the interplay between sleep quality and psychiatric symptoms in predicting alcohol-related consequences among heavy-drinking young adult using two widely-utilized screening measures. Consistent with previous research (Bruck & Astbury, 2012;

Johnson & Breslau, 2001; Kenney et al., 2012; Popovici & French, 2013; Wong et al., 2015), we expected poor sleep quality and symptoms suggestive of a psychiatric disorder to predict greater alcohol-related consequences among heavy-drinking college students. Moreover, we hypothesized that poor sleep quality would moderate the association between psychiatric symptoms and alcohol-related consequences, such that psychiatric symptoms would be associated with more alcohol-related consequences in the context of poor sleep quality.

1. Method

1.1. Participants and procedure

Data for the current study were derived from a research study examining sleep and genetics in matriculating college students (Carskadon, Sharkey, Knopik, & McGeary, 2012). First-year college students at a private university in the Northeastern United States were invited by email to participate in the trial. Participants completed an initial survey after accepting college admission. Those who participated in the initial survey were then invited to take part in Phase 2 of the study, in which participants completed online daily diaries for the first nine weeks of their first semester by logging onto the survey website with an identification number and password. Diaries assessed sleep patterns and daily activities, including daily alcohol use. At the end of those nine weeks, a link to the final online outcome survey was provided. Students received \$1 for completing each diary (and small \$1 bonuses for completion of three and seven consecutive diaries) and \$18 for completing the final outcome survey. All procedures were approved by the Institutional Review Board.

Participants selected for the current analysis were heavy-drinking college students who completed at least 50% of daily diaries in the first nine weeks of the semester. Of the 1085 students (58% female; 55% White; $M_{\text{age}} = 18.7$, $SD = 0.5$) who provided data for the study, 11 were excluded for completing <50% of daily diaries, 48 participants did not provide sufficient data to be categorized into sleep/psychiatric symptom groups, and 641 denied at least one heavy drinking episode (defined as 4/5+ drinks on one occasion for women/men; Wechsler et al., 2002) over the first nine weeks of the semester. Thus, the final sample included 385 participants (see Table 2 for descriptive statistics). Those excluded from analyses were more likely than those included to be female, $\chi^2(1) = 8.82$, $p = 0.003$, and non-White, $\chi^2(1) = 26.30$, $p < 0.001$. They did not differ significantly in terms of age, $t(913) = 0.86$, $p = 0.39$; sleep quality, $t(958) = -0.19$, $p = 0.85$; or psychiatric symptoms, $t(957) = 0.88$, $p = 0.38$.

2. Measures

2.1. Demographic information

Participants provided information regarding their gender, age, year in school, and race/ethnicity as part of the initial survey.

2.2. Alcohol use

Participants completed nine weeks of daily diaries that included an item assessing how many alcoholic drinks (0 through 9+) they had consumed in the last 24 h (drinks per drinking day). Participants who reported heavy episodic drinking (4/5+ drinks for women/men) in the past 24 h were classified as having had a 'heavy-drinking' day. Participants who denied at least one heavy drinking day over the first nine weeks of the semester were excluded from this study.

2.3. Alcohol-related consequences

The Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ) (Kahler, Hustad, Barnett, Strong, & Borsari, 2008) was

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