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Adolescents who sleep poorly and insufficiently may develop alcohol and drug problems

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Sleep difficulties and insufficient sleep are common among American youth. Prior research has shown that poor sleep can predict alcohol-related problems and illicit drug use among adolescents and young adults in high-risk samples. A new study has found that sleep difficulties and hours of sleep can predict a number of specific problems, including binge drinking, driving under the influence of alcohol, and risky sexual behavior in a nationally representative sample.

Results will be published in the February 2015 online-only issue of *Alcoholism: Clinical & Experimental Research* and are currently available at Early View.

"National polls indicate that 27 percent of school-aged children and 45 percent of adolescents do not sleep enough," said Maria M. Wong, professor and director of experimental training in the department of psychology at Idaho State University. "Other studies have shown that about one in 10 adolescents have trouble falling asleep or staying asleep almost every day, or every day, in the previous 12 months." Wong is also the corresponding author for the study.

"This paper is important in that it advances our understanding of the relation of sleep to substance use problems to include not only problems sleeping, that is, trouble falling asleep and/or staying asleep, but also insufficient sleep, addressed here as hours of sleep," added Tim Roehrs,

director of research at the Sleep Disorders and Research Center at the Henry Ford Hospital, and one of the first researchers to identify sleep insufficiency as a clinical issue in the 1990s.

"Among normal adults, sleep difficulties and insomnia have predicted onset of alcohol use one year later, and increased risk of any illicit drug use disorder and nicotine dependence 3.5 years later," said Wong. "Among adult alcoholics who received treatment for alcohol dependence, those with insomnia at baseline were more likely to relapse to alcohol use. The association between poor sleep and substance use has also been found in younger age groups. Overtiredness in childhood has predicted lower response inhibition in adolescence, which in turn predicted number of illicit drugs used in young adulthood. Overtiredness in childhood has also directly predicted the presence of binge drinking, blackouts, driving after drinking alcohol, and number of lifetime alcohol problems in young adulthood. The purpose of this study was to examine whether sleep difficulties and hours of sleep prospectively predicted several serious substance-related problems that included binge drinking, driving under the influence of alcohol, and risky sexual behavior."

Wong and her co-authors analyzed data collected via interviews and questionnaires from 6,504 adolescents (52% girls, 48% boys) participating in the National Longitudinal Study of Adolescent Health. Data were collected for three waves - 1994-1995, 1996, and 2001-2002 - and study authors used sleep difficulties from a previous wave to predict substance-related problems at a subsequent wave, while controlling for substance-related problems at the previous wave.

"Sleep difficulties at the first wave significantly predicted alcohol-related interpersonal problems, binge drinking, gotten drunk or very high on alcohol, driving under the influence of alcohol, getting into a sexual situation one later regretted due to drinking, and ever using any illicit drugs and drugs-related problems at the second wave," said Wong.

"Substance-related problems such as binge drinking, driving under the influence of alcohol, and risky sexual behavior are more important than others due to their association with reckless driving, automobile accidents, physical injuries and even death, as well as risk for sexually transmitted disease and unplanned pregnancy."

"The rate of sleep problems in this sample of adolescents is quite similar to that of adults," added Roehrs, "about 10 percent chronic insomnia and about 30 percent occasional insomnia. This speaks to the underlying biological basis of insomnia. Furthermore, the consequences of sleep difficulty and sleep insufficiency when added to use of alcohol or other substances can impact both medical and behavioral areas. And which is more important depends on whether one focuses on short-term or long-term consequences - the immediate impact of an automobile accident or reduced future job opportunities because of lost educational engagement."

"Previous studies on adolescents were mostly drawn from high risk samples," noted Wong. "This study has added to the existing literature by establishing the relationship between two sleep variables - sleep difficulties and hours of sleep - and the odds of serious alcohol- and drug-related problems in a nationally representative sample."

Both Wong and Roehrs believe that parents can play a significant role regarding their adolescents' sleep habits.

"Parents need to understand their children's sleep schedule, patterns, and habits," said Wong. "If children have sleep difficulties or poor sleep hygiene, it is important for parents to talk to them and find out the factors that may be causing the problems. Parents could explain the importance of sleep to their children, for example, how sleep may affect the development of the brain and thus self-control and behavior. Parents could also help their children keep a regular sleep schedule and

monitor/control their children's activities before sleep, for example, no video games or texting after a certain time at night."

"And remember," added Roehrs, "when you monitor the sleep health of your adolescent, there can be two different issues: sleep difficulty and sleep insufficiency."

Wong hopes future research will address how sleep difficulties and deprivation may affect brain mechanisms, which in turn influence control of affect, cognitive processes, and behavior. "Prolonged periods of wakefulness appears to adversely affect the prefrontal cortex or PFC," she said. "PFC regulates affect, attention, and complex cognitive activities. One recent study showed that sleep-deprived subjects experienced a loss of functional connectivity between the amygdala and the medial-PFC compared to controls. Thus, future studies could examine how neural circuitries mediate the effect of sleep problems on self-regulation and risk behavior."

More information: "Prospective relationship between poor sleep and substance-related problems in a national sample of adolescents," *Alcoholism: Clinical & Experimental Research*, 2015.

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