More sleep could reduce impulsive behavior in children

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Sleep is a critical part of a child's overall health, but it can also be an important factor in the way they behave.

According to a new study from the Youth Development Institute at University of Georgia, getting enough sleep can help children combat the effects of stressful environments.

"Stressful environments are shown to make adolescents seek immediate rewards rather than delayed rewards, but there are also adolescents who are in stressful environments who are not impulsive," said lead author Linhao Zhang, a fourth-year doctoral student in UGA's College of Family and Consumer Sciences. "We looked at what explains that link and what makes some people differ from others. One mechanism we found is sleep."

Researchers analyzed data from the Adolescent Brain Cognitive Development Study, a multi-year brain development study by the National Institutes of Health. Using information from 11,858 children from 9–10 years old, they found that lack of sleep and long sleep latency—the amount of time it takes to get to sleep—had a significant link to impulsive behaviors down the line.

Sleep problems, such as sleep latency (the time it takes an individual to fall asleep) and impulsive behaviors, were checked at multiple time points over the course of two years. When children got less than the recommended nine hours of sleep or took more than 30 minutes to get to sleep, there was a strong link to impulsive behaviors later down the line. Some of these behaviors included acting without a plan, seeking thrills or sensations, and lacking perseverance.

Sleep was a mediator between these actions, however, and when sleep problems were absent during the study, impulsivity was also less likely to be observed in the future.

Neurological hyperconnectivity, wherein the adolescents' brains remained very active even when they were not actively engaged in tasks,

also played a role, Zhang said. This study looked at the default mode network, a brain network related to goal-directed behaviors. When this network was hyperactive during resting-state, it could exacerbate the link between stressful environments, sleep and impulsivity. This connection could be linked to ADHD, which Zhang would like to explore in future studies.

"We can look at the default mode network and emotional regulation regions," Zhang said. "It's also possible that this hyperactivity and ADHD are highly correlated, so in a future study, we could test that in a more clinical setting. That could have great implications on intervention or counseling programs."

These findings not only highlight sleep's role in cognitive and behavioral development, but could also inform low-cost interventions to aid in the psychological development of children facing at-home stressors, Zhang said.

"If you want to develop interventions for people in stressful environments, it's very costly, and sometimes it needs generational work to change," Zhang said. "Sleep is a modifiable behavior, however, and these changes can be cost-efficient."

Zhang said that too little sleep can be an issue even outside stressful environments. For example, teenagers often have a circadian rhythm that is geared toward staying up later and sleeping in, but early school start times and late nights completing homework can throw off that rhythm.

"A lot of adolescents don't have enough time to sleep, and they are sleep deprived," Zhang said. "This study shows why it is important to promote longer sleep duration by delaying school start times or establishing routines so that adolescents know, 'OK, after this event, I'm going to bed.'"

Establishing these routines, no matter the environment, can create healthier patterns and reduce the time it takes to get to sleep. It's also vital to act early when developing sleep habits, Zhang said.

"For people who may be in disadvantaged environments, if we can provide some strategies that help sleep, it can have a positive impact, especially for adolescents that are at such a critical developmental stage for their brain development."

The findings are published in the journal *Sleep Health*.

More information: Linhao Zhang et al, Sleep mediates the effect of stressful environments on youth development of impulsivity: The moderating role of within default mode network resting-state functional connectivity, *Sleep Health* (2023). DOI: 10.1016/j.sleh.2023.03.005

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