Interactive screen use reduces sleep time in kids, researchers find

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While screen time is generally known to affect sleep, new research suggests that interactive engagement, such as texting friends or playing video games, delays and reduces the time spent asleep to a greater extent

than passive screen time, like watching television—especially for teens.

The research, published in the *Journal of Adolescent Health,* demonstrates that adolescents at age 15 who used screens to communicate with friends or play video games in the hour before bed took 30 minutes longer to fall asleep than if they had refrained from interactive screen time. But it wasn't just interactive screen time before bed that affected kids' sleep, researchers said. For each hour during the day that kids spent playing video games beyond their usual amount, their sleep was delayed by about 10 minutes.

"If teens typically play video games for an hour each day, but one day a new game comes out and they play for four hours, that's three additional hours more than they typically play," said David Reichenberger, postdoctoral scholar at Penn State and lead author on the study.

"So, that means they could have 15 minutes of delayed sleep timing that night. For a child, losing 15 minutes of sleep at night is significant. It's especially difficult when they have to get up in the morning for school; if they're delaying their sleep, they can't make up for it in the morning. Without adequate sleep, kids are at increased risk of obesity, as well as impaired cognition, emotion regulation and mental health."

The team assessed the daytime screen-based activities of 475 adolescents using daily surveys for three or more days. They asked the teens how many hours they had spent that day communicating with friends by email, instant messaging, texting on the phone or through social media sites.

They also asked the kids how many hours they spent playing video games, surfing the internet and watching television or videos. Finally, the researchers asked if the adolescents had participated in any of these activities in the hour before bed.

Next, the team used accelerometers to measure the adolescents' sleep duration for one week. Reichenberger explained that the devices, typically worn on the wrist, measures a person's movements. "When the participant is least active, we can infer that they are likely asleep," Reichenberger said. "It's more accurate than asking them how many hours they slept."

The researchers found that the teens spent an average of two hours per day communicating with friends via email, instant messaging, texting on the phone or through social media. They spent slightly less time—about 1.3 hours per day—playing video games, less than an hour per day surfing the internet and about 1.7 hours per day watching television or videos. In the hour before bed, the children communicated or played video games via a phone, computer or tablet 77% of the time and watched television or movies 69% of the time.

Overall, the adolescents slept for an average of 7.8 hours per night. For every hour throughout the day that they used screens to communicate with friends, they fell asleep about 11 minutes later on average. For every hour that they used screens to play video games, they fell asleep about nine minutes later. Those who talked, texted or played games on a device in the hour before bed lost the most sleep: their sleep onset was about 30 minutes later.

Interestingly, Reichenberger said, the team found no significant associations between passive screen-based activities and subsequent sleep, like browsing the internet and watching television, videos and movies.

"It could be that these more passive activities are less mentally stimulating than interactive activities, like texting and video game playing," said Anne-Marie Chang, associate professor of biobehavioral health and study co-author.

So, what can parents do to help protect their teens' sleep?

"It's a tricky situation," Chang said. "These tools are really important to everyone nowadays, so it's hard to put a limit on them, but if you're really looking out for an adolescent's health and well-being, then you might consider limiting the more interactive activities, especially in the hour before bed."

Other authors on the paper include Lindsay Master, researcher, Penn State; Orfeu Buxton, the Elizabeth Fenton Susman Professor of Biobehavioral Health, Penn State; Gina Marie Mathew, postdoctoral associate, Stony Brook University; Lauren Hale, professor of family, population and preventive medicine, Stony Brook University; and Cynthia Snyder, assistant professor of nursing, Pennsylvania College of Health Sciences.

More information: David Reichenberger et al, *Journal of Adolescent Health* (2023). dx.doi.org/10.1016/j.jadohealth.2023.10.027

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