

# Playing a video game before bedtime has only a mild effect on adolescent sleep

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A study in the April 15 issue of the *Journal of Clinical Sleep Medicine* suggests that playing a video game before bedtime has only a mild effect on the sleep of older male teens.

Results show that after playing a stimulating video game it took [adolescents](#) a median of 7.5 minutes to fall asleep, which was only slightly longer than the three minutes it took them to fall asleep after passively watching a documentary on DVD. Although no participants fell asleep while playing the video game, almost one-third of them fell asleep while watching the DVD. Subjective sleepiness after playing the video game was only slightly lower than after watching the DVD, and playing the video game was associated with a small increase in cognitive alertness. However, no significant differences in physiologic arousal or sleep architecture were found between testing conditions.

"Initially we were surprised that playing the [violent video game](#) did not lead to a much longer time taken to fall asleep," said research supervisor Michael Gradisar, PhD, senior lecturer in clinical child psychology at Flinders University in Adelaide, South Australia. "Although the scientific literature is sparse when it comes to measuring sleep latency associated with playing video games, anecdotally a lot of people report difficulty falling asleep after [playing video games](#) at night."

The study involved thirteen male students between 14 and 18 years of age who were good sleepers, normally falling asleep in less than 15 minutes. They were "evening types" who did not have excessive daytime

sleepiness and had no identifiable [sleep disorders](#). Participants completed a seven-day sleep diary for the week prior to their initial testing night. This information was used for the testing conditions so that participants attempted to sleep at their usual [bedtime](#).

The study was conducted at the Flinders University Sleep Laboratory, where participants sat in bed beneath the covers with electrodes attached and lights dimmed for both testing conditions. During the 50-minute experimental session the teens played the Sony PlayStation 3 video game "Call of Duty 4: Modern Warfare," which was the top-selling game of 2007. During the control condition on a separate night they spent an equal amount of time watching "March of the Penguins," which won the 2006 Academy Award for Best Documentary Feature. The two visits to the sleep lab were separated by exactly one week.

"We purposefully chose a very tranquil movie to contrast against the very stimulating effect of playing a violent video game in the hope of producing the greatest effect on sleep." noted Gradisar.

Sleep-onset latency and sleep architecture were measured by electroencephalography (EEG), electromyography (EMG) and electro-oculography (EOG). Cognitive alertness also was measured by EEG, with a higher maximum alpha-power reading indicating reduced cognitive alertness. Participants wore an oximeter probe on their right index finger to measure heart rate, the most common index of physiologic arousal. Subjective sleepiness was assessed using the Stanford Sleepiness Scale.

Eleven adolescents took longer to fall asleep after playing the video game than after watching the documentary, while two of them fell asleep faster. Seven teens reported that they felt less sleepy after playing the video game than after watching the DVD, four indicated the same level of sleepiness and two felt less sleepy after watching the movie. No

significant differences were found between conditions in the percentage of total sleep time comprised of rapid eye movement (REM) sleep or slow-wave sleep.

According to the authors, the extent to which the results reflect genuine sleep impairment is questionable. The increase in sleep-onset latency was small and may have few perceptible ramifications for adolescent sleep. However, the observed reduction in subjective sleepiness may be enough to cause teens to postpone going to bed until later at night. Gradisar also noted that the 50-minute experimental session may not reflect the reality of teens' gaming experience at home.

"Very few teens would limit their playing time to a single night of 50 minutes," said Gradisar. "With greater time invested there could be a greater emotional investment in the game. What happens to the teen's virtual character could begin to evoke feelings of anxiety and/or frustration that could have quite larger effects on their sleep."

The authors also pointed out that the participants were older teens with a mean age of 16 years and seven months, so it is possible that playing a video game before bedtime has a more severe effect on the sleep of younger adolescents. The teens in the study also were good sleepers, so playing a video game might have a greater impact on adolescents who normally take a long time to fall asleep. Frequent gaming also could desensitize adolescents to its stimulating effects, in which case teens who play only occasionally would experience greater [sleep](#) impairments.

Gradisar also suspects that sleeplessness could occur when the video games that teens play before bedtime require high levels of physical activity.

"When you add the effect of physical movement to the game-playing experience, such as playing "Guitar Hero" or Nintendo Wii, you're sure

to increase alertness even further," he said. "Such movement would increase one's body temperature, and with increased body temperature comes increased [alertness](#)."

The authors concluded that the adage "everything in moderation" should guide parents as they set limits on bedtime video-game playing for adolescents.

Provided by American Academy of Sleep Medicine

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