Study shows lasting effects of sleep loss

Students burning both ends of the candle might recover by sleeping in during the weekends, but their grades might not.

A study recently published in the *American Journal of Physiology* suggests that sleeping in on the weekend doesn't reverse all the effects of weekday sleep loss.

The 13-day study was conducted by researchers at the Pennsylvania State University College of Medicine. They recruited 30 healthy volunteers who were considered normal sleepers.

For the first four days, the volunteers slept eight hours to establish a standard for normal sleep and normal body function. The next six days, the volunteers slept only six hours, mimicking a sleep-deprived week. For the last three days, the volunteers slept for 10 hours, mimicking a weekend of recovery sleep.

As the researchers expected, volunteers felt significantly sleepier after five days of sleep deprivation. In addition, their levels of interleukin-6 and cortisol, molecules that signal inflammation and stress respectively, increased during the period of sleep deprivation, indicating conditions that are harmful to an individual's health. After a period of recovery sleep, however, the levels of the molecules returned to the levels shown during normal sleep and volunteers felt less sleepy. This shows that sleeping in on the weekend can reverse harmful health effects caused by weekday sleep loss.

In contrast, cognitive function did not show the same pattern. This was measured by an attention test administered to the volunteers at three different times during the study. The results worsened during sleep deprivation and did not return to normal results even after recovery sleep.

For students this means staying up late to cram for that chemistry exam may not be as helpful as they think. The attention test administered during the study did not evaluate the cognitive functions associated with studying and exam-taking. However, according to Gatorwell, the health promotional service at the University of Florida, sleep is crucial to memory consolidation, which is the process by which we learn and are able to recall information.

Despite these findings, students continue sacrificing sleep for other activities.

"My normal priority is just to do well," Drake Castaneda said.

Casteneda, a 20-year-old junior studying political science at UF, has heard the various studies on sleep, but chooses to forgo his eight hours nonetheless.

"It does take a toll after a while, but for a little bit it's not that big of a deal," Casteneda said.

Castenda said he is always sleep deprived, so he doesn't feel the effects of sleep deprivation during exam week.

Lauren Munsey, a 20-year-old junior studying public relations at UF, also gives up sleep when she has too much to do.

"Once midterms, finals and papers come around, you just push it to the back of your head and just make sure everything gets done correctly," Munsey said.

In addition to being a full-time student, Munsey juggles a job, participates in extracurriculars and tries to maintain a social life when she has time.

Gatorwell at UF, however, strongly emphasizes the benefits of sleep: better mental health, better physical health and better academic performance. Gatorwell's website offers students advice on how to make the most of their rest:

Maintain a regular sleep schedule. This can be achieved by avoiding naps and being exposed to sunlight during the day. If given the choice to wake up at a normal time or sleep in to catch up on sleep, students should wake up at their normal time. Sleeping in disrupts sleep cycles, which can have detrimental effects for days. Though students may believe that it's possible to become accustomed to an irregular sleep schedule, the negative effects of such a habit compound and worsen as time goes on. Being a few hours sleep deprived only affects students for that day.

Associate the bed and bedroom with sleep only. Don't study, eat or do any activity besides sleep in bed. Going to bed only when feeling drowsy and sticking to a bedtime ritual are other ways to help students associate their bed and bedroom with sleeping. This will help students fall asleep faster when they decide to go to sleep, which in turns helps maintain that regular sleep cycle.

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Avoid physiological arousal before bedtime. This includes not smoking, not drinking alcohol and not exercising two hours before bed. Caffeine should be avoided six hours before going to sleep.

Gatorwell said these small changes can have big effects. In a study referenced by Gatorwell, students who reported grades of A's and B's slept 25 minutes more and 40 minutes earlier per night than students who reported grades of C's. Furthermore, in a separate study, sleep was shown to have a greater impact on grade point average than exercise, mood state, nutrition, perceived stress, time management and other tested factors.

Even though sleeping well is the best way, there are times when students may have to lose sleep. Munsey, a student at UF, has her own way of coping with sleep deprivation.

"I just try and relax myself and let myself know that doing this stuff is bettering my life, and there are people out there who will never have this experience, will never have an education," Munsey said. "I've got to appreciate this stress and I've got to just channel it in a different way.