

Sleep Deprivation Linked to Junk Food Cravings

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A sleepless night makes us more likely to reach for doughnuts or pizza than for whole grains and leafy green vegetables, suggests a new study from UC Berkeley that examines the brain regions that control food choices. The findings shed new light on the link between poor sleep and obesity.



Using functional magnetic resonance imaging (fMRI), UC Berkeley researchers scanned the brains of 23 healthy young adults, first after a normal night's sleep and next, after a sleepless night. **They found impaired activity in the sleep-deprived brain's frontal lobe, which governs complex decision-making, but increased activity in deeper brain centers that respond to rewards.** Moreover, the participants favored unhealthy snack and junk foods when they were sleep deprived.

"What we have discovered is that high-level brain regions required for complex judgments and decisions become blunted by a lack of sleep, while more primal brain structures that control motivation and desire are amplified," said Matthew

Walker, a UC Berkeley professor of psychology and neuroscience and senior author of the study published Aug. 6 in the journal Nature Communications.

Moreover, he added, "**high-calorie foods also became significantly more desirable when participants were sleep-deprived.** This combination of altered brain activity and decision-making may help explain why people who sleep less also tend to be overweight or obese."

Previous studies have linked poor sleep to greater appetites, particularly for sweet and salty foods, but the latest findings provide a specific brain mechanism explaining why food choices change for the worse following a sleepless night, Walker said.

"These results shed light on how the brain becomes impaired by sleep deprivation, leading to the selection of more unhealthy foods and, ultimately, higher rates of obesity," said Stephanie Greer, a doctoral student in Walker's Sleep and Neuroimaging Laboratory and lead author of the paper. Another co-author of the study is Andrea Goldstein, also a doctoral student in Walker's lab.

In this newest study, researchers measured brain activity as participants viewed a series of 80 food images that ranged from high-to low-calorie and healthy and unhealthy, and rated their desire for each of the items. As an incentive, they were given the food they most craved after the MRI scan.

Food choices presented in the experiment ranged from fruits and vegetables, such as strawberries, apples and carrots, to high-calorie burgers, pizza and doughnuts. The latter are examples of the more popular choices following a sleepless night.

On a positive note, Walker said, the findings indicate **that "getting enough sleep is one factor that can help promote weight control by priming the brain mechanisms governing appropriate food choices."**

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