

# Sleep deprivation may lead to higher anxiety levels, fMRI scans show

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New research shows that sleep loss markedly exaggerates the degree to which we anticipate impending emotional events, particularly among highly anxious people, who are especially vulnerable.

Two common features of [anxiety disorders](#) are sleep loss and an amplification of emotional response. Results from the new study suggest that these features may not be independent of one another but may interact instead.

Researchers from the Sleep and Neuroimaging Laboratory at the University of California, Berkeley, used brain scanning on 18 healthy adults in two separate sessions, one after a normal night's sleep and a second after a night of sleep deprivation. During both sessions, participants were exposed to an emotional task that involved a period of anticipating a potentially [negative experience](#) (an unpleasant [visual image](#)) or a potentially benign experience (a neutral visual image).

The fMRI scans showed that sleep deprivation significantly amplified the build-up of anticipatory activity in deep emotional brain centers, especially the amygdala, a part of the brain associated with responding to negative and unpleasant experiences. In some of these emotional centers of the brain, sleep deprivation detrimentally triggered an increase in anticipatory reaction by more than 60 percent.

In addition, the researchers found that the strength of this sleep deprivation effect was related to how naturally anxious the participants were. Those people who were more anxious showed the greatest vulnerability to the aggravating effects of sleep deprivation. The results suggest that anxiety may significantly elevate the emotional dysfunction and risk associated with insufficient sleep.

"Anticipation is a fundamental brain process, a common [survival mechanism](#) across numerous

species," said Andrea Goldstein, lead author of the study and a graduate student in the Sleep and Neuroimaging Laboratory. "Our results suggest that just one night of [sleep loss](#) significantly alters the optimal functioning of this essential brain process, especially among anxious individuals. This is perhaps never more relevant considering the continued erosion of sleep time that continues to occur across society."

**More information:** The abstract "Tired, anxious and expecting the worst: The impact of sleep deprivation and anxiety on emotional brain anticipation" is being presented today at SLEEP 2012, the 26th annual meeting of the Associated Professional Sleep Societies (APSS) in Boston.

Provided by American Academy of Sleep Medicine

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