

# Study shows that insomnia may cause dysfunction in emotional brain circuitry

22 May 2013

A new study provides neurobiological evidence for dysfunction in the neural circuitry underlying emotion regulation in people with insomnia, which may have implications for the risk relationship between insomnia and depression.

"Insomnia has been consistently identified as a risk factor for depression," said lead author Peter Franzen, PhD, an assistant professor of psychiatry at the University of Pittsburgh School of Medicine. "Alterations in the [brain circuitry](#) underlying emotion regulation may be involved in the pathway for depression, and these results suggest a mechanistic role for sleep disturbance in the development of psychiatric disorders."

The study involved 14 individuals with chronic primary insomnia without other primary psychiatric disorders, as well as 30 good sleepers who served as a control group. Participants underwent an fMRI scan during an emotion regulation task in which they were shown negative or neutral pictures. They were asked to passively view the images or to decrease their [emotional responses](#) using cognitive reappraisal, a voluntary emotion regulation strategy in which you interpret the meaning depicted in the picture in order to feel less negative.

Results show that in the primary insomnia group, amygdala activity was significantly higher during reappraisal than during passive viewing. Located in the temporal lobe of the brain, the amygdala plays an important role in emotional processing and regulation.

In analysis between groups, amygdala activity during reappraisal trials was significantly greater in the primary insomnia group compared with good sleepers. The two groups did not significantly differ when passively viewing negative pictures.

"Previous studies have demonstrated that successful [emotion regulation](#) using reappraisal

decreases [amygdala](#) response in healthy individuals, yet we were surprised that activity was even higher during reappraisal of, versus passive viewing of, pictures with negative [emotional content](#) in this sample of individuals with primary insomnia," said Franzen.

The research abstract was published recently in an online supplement of the journal *Sleep*, and Franzen will present the findings Wednesday, June 5, in Baltimore, Md., at SLEEP 2013, the 27th annual meeting of the Associated Professional Sleep Societies LLC.

The American Academy of Sleep Medicine reports that about 10 to 15 percent of adults have an insomnia disorder with distress or daytime impairment. According to the National Institute of Mental Health, 6.7 percent of the U.S. adult population suffers from major depressive disorder. Both insomnia and depression are more common in women than in men.

**More information:** "Elevated amygdala activation during voluntary emotion regulation in primary insomnia," *Sleep*, 2013.

Provided by American Academy of Sleep Medicine

APA citation: Study shows that insomnia may cause dysfunction in emotional brain circuitry (2013, May 22) retrieved 19 June 2021 from <https://medicalxpress.com/news/2013-05-insomnia-dysfunction-emotional-brain-circuitry.html>

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