

Anxious? Activate your anterior cingulate cortex with a little meditation

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Scientists, like Buddhist monks and Zen masters, have known for years that meditation can reduce anxiety, but not how. Scientists at Wake Forest Baptist Medical Center, however, have succeeded in identifying the brain functions involved.

"Although we've known that meditation can reduce anxiety, we hadn't identified the specific brain mechanisms involved in relieving anxiety in healthy individuals," said Fadel Zeidan, Ph.D., postdoctoral research fellow in neurobiology and anatomy at Wake Forest Baptist and lead author of the study. "In this study, we were able to see which areas of the brain were activated and which were deactivated during meditation-related anxiety relief."

The study is published in the current edition of the journal *Social Cognitive and Affective Neuroscience*.

For the study, 15 healthy volunteers with normal levels of everyday anxiety were recruited for the study. These individuals had no previous meditation experience or anxiety disorders. All subjects participated in four 20-minute classes to learn a technique known as mindfulness meditation. In this form of meditation, people are taught to focus on breath and body sensations and to non-judgmentally evaluate distracting thoughts and emotions.

Both before and after meditation training, the study participants' brain activity was examined using a special type of imaging -- arterial spin labeling magnetic resonance imaging -- that is very effective at imaging brain processes, such as meditation. In addition, anxiety reports were measured before and after brain scanning.

The majority of study participants reported decreases in anxiety. Researchers found that meditation reduced anxiety ratings by as much as 39 percent.

"This showed that just a few minutes of mindfulness meditation can help reduce normal everyday anxiety," Zeidan said.

The study revealed that meditation-related anxiety relief is associated with activation of the anterior cingulate cortex and ventromedial prefrontal cortex, areas of the brain involved with executive-level function. During meditation, there was more activity in the ventromedial prefrontal cortex, the area of the brain that controls worrying. In addition, when activity increased in the anterior cingulate cortex -- the area that governs thinking and emotion -- anxiety decreased.

"Mindfulness is premised on sustaining attention in the present moment and controlling the way we react to daily thoughts and feelings," Zeidan said. "Interestingly, the present findings reveal that the brain regions associated with meditation-related anxiety relief are remarkably consistent with the principles of being mindful."

Research at other institutions has shown that meditation can significantly reduce anxiety in patients with generalized anxiety and depression disorders. The results of this neuroimaging experiment complement that body of knowledge by showing the brain mechanisms associated with meditation-related anxiety relief in healthy people, he said.

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Journal Reference:

1. . Zeidan, K. T. Martucci, R. A. Kraft, J. G. McHaffie, R. C. Coghill. **Neural Correlates of Mindfulness Meditation-Related Anxiety Relief**. *Social Cognitive and Affective Neuroscience*, 2013; DOI: [10.1093/scan/nst041](https://doi.org/10.1093/scan/nst041)

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