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Title

Meditation Training Leads to Changes in Regional Gray Matter Concentration

Permalink

<https://escholarship.org/uc/item/4r16x3j6>

Journal

Explore: The Journal of Science & Healing, 5(3)

ISSN

1550-8307

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Publication Date

2009-05-01

DOI

10.1016/j.explore.2009.03.058

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Peer reviewed

**Britta Hoelzel, James Carmody, Jeffery Dusek, Elizabeth Hoge, Sara Lazar, Lucas Morgan, and Sita Yerramsetti:
MEDITATION TRAINING LEADS TO CHANGES IN REGIONAL
GRAY MATTER CONCENTRATION**

Previous studies have demonstrated that highly experienced mindfulness meditators exhibit a different cortical structure (specifically concentration and thickness of gray matter) in multiple brain regions when compared with nonmeditating controls. However, those cross-sectional studies cannot establish whether the gray matter differences resulted from the meditation practice or if they were preexisting. We report a longitudinal study that investigates the effects of meditation training on gray matter concentration in meditation-naïve individuals. Twenty-seven healthy but highly stressed participants underwent an eight-week mindfulness-based stress reduction course that included different mindfulness exercises, such as mindful yoga, bodyscan, and breath awareness meditation. Anatomical magnetic resonance images (Magnetization Prepared Rapid Gradient Echo) were acquired before and after the training, and data were analyzed in Statistical Parametric Mapping Software (SPM5) <http://www.fil.ion.ucl.ac.uk/spm/software/spm5/>. Paired *t* tests show that there are significant increases in gray matter concentration in brain regions that are involved in the task of meditation. This study clearly demonstrates that mindfulness meditation training is associated with an increase in gray matter concentration in brain regions associated with meditation practice.