Reductions in perceived stress following Transcendental Meditation practice are associated with increased brain regional connectivity at rest

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Abstract

Transcendental Meditation (TM) is defined as a mental process of transcending using a silent mantra. Previous work showed that relatively brief period of TM practice leads to decreases in stress and anxiety. However, whether these changes are subserved by specific morpho-functional brain modifications (as observed in other meditation techniques) is still unclear.

Using a longitudinal design, we combined psychometric questionnaires, structural and resting-state functional magnetic resonance imaging (RS-fMRI) to investigate the potential brain modifications underlying the psychological effects of TM.

The final sample included 19 naïve subjects instructed to complete two daily 20-min TM sessions, and 15 volunteers in the control group. Both groups were evaluated at recruitment (T0) and after 3 months (T1). At T1, only meditators showed a decrease in perceived anxiety and stress ($t(18) = 2.53$, $p = 0.02$), which correlated negatively with T1-T0 changes in functional connectivity among posterior cingulate cortex (PCC), precuneus and left superior parietal lobule.

Additionally, TM practice was associated with increased connectivity between PCC and right insula, likely reflecting changes in interoceptive awareness. No structural changes were observed in meditators or control subjects. These preliminary findings indicate that beneficial effects of TM may be mediated by functional brain changes that take place after a short practice period of 3 months.

https://www.medicalnewstoday.com/articles/how-transcendental-meditation-alters-the-brain

How transcendental meditation alters the brain

Transcendental meditation (TM) involves sitting with eyes shut for 15–20 minutes twice a day while saying a mantra. The practice has several advantages for mental health but, until now, it was **unclear how those effects came about**.

New research sheds light on the brain alterations that transcendental meditation can induce.TM differs from other meditation practices in that it does not require concentration or visualization. Instead, TM practitioners come up with a mantra, which is a word or phrase that has no real meaning.

The practitioners silently think this mantra, allowing the mind to naturally transcend, while both the mind and body remain awake, yet relaxed.

Most people can learn TM in a few months, and benefits from regular practice may include reduced feelings of stress and anxiety in a person's everyday life.

Previous proof

Research has found some evidence of this. A 2013 study, appearing in **Military Medicine**, listed TM as a feasible treatment for post-traumatic stress disorder (PTSD) in active-duty military personnel.
Similarly, a study appearing in **The Permanente Journal** in 2014, concluded that a TM program was effective in reducing psychological distress in teachers. A 2016 study from the same journal found significant reductions in symptoms of trauma, anxiety, and depression in prison inmates who practiced TM.

With benefits seen in a relatively short period, one field of study has dived deeper into TM to find out exactly how it helps. **Now, new findings published in *Brain and Cognition* *point to measurable functional effects in the brain of TM practitioners.**

Lowering stress and anxiety

The study took place in the **Molecular Mind Laboratory of Italy's IMT School for Advanced Studies** Lucca and involved 34 participants. Of the volunteers, 19 had to complete two 20-minute TM sessions a day for 3 months — one session in the morning and one in the evening. The remaining 15 participants continued with their usual daily routines.

At the beginning of the study, the researchers used psychometric questionnaires to measure how well each participant could handle stressful situations. All participants also underwent a functional magnetic resonance imaging test (fMRI) to assess brain activity and functional connectivity between various areas of the brain. At the end of the 3 months, each participant underwent another fMRI test and filled in the questionnaires again.

After 3 months, the participants who practiced daily TM perceived feeling markedly less stress and anxiety.

"Specifically, following TM practice, the group of meditators reported a reduction in psychometric scores reflecting perceived depression, anxiety and stress in opposition to resilience and social skills," the authors write in the paper.

Results from the fMRI scans also showed "that the reduction of anxiety levels is associated with specific changes in the connectivity between different cerebral areas, such as precuneus, left parietal lobe, and insula, which all have an important role in the modulation of emotions and inner states," says first author Giulia Avvenuti.

However, "none of these changes [were] observed" in the group that did not practice TM, Avvenuti points out.

Quick changes

Pietro Pietrini, study coordinator and IMT School's director, says these findings raise further questions about the link between the brain and the mind.

"The fact that [TM] has measurable effects on the 'dialogue' between brain structures involved in the modulation of affective states opens new perspectives for the understanding of brain-mind relationships," he says.

The results may also indicate just how quickly TM can have a tangible effect on the brain and the feelings of individuals.

Written by Lauren Sharkey on March 5, 2020 - Fact checked by Harriet Pike