

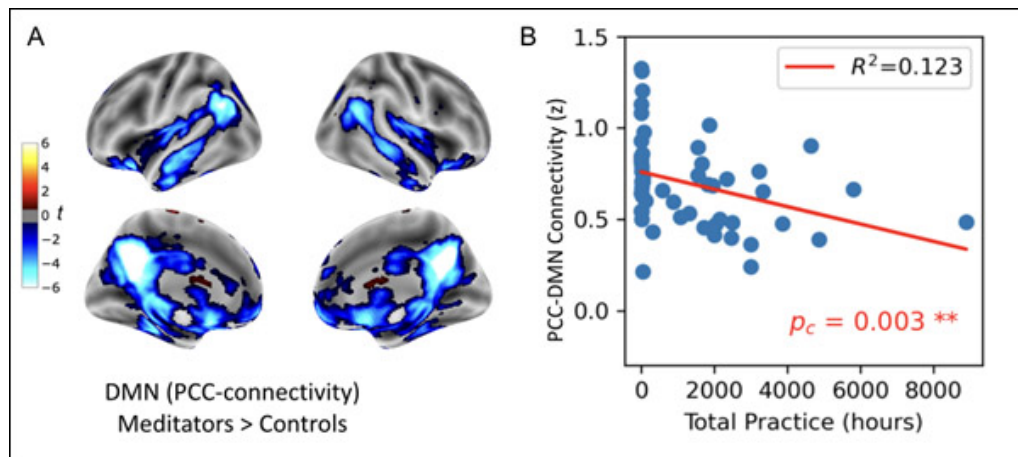
Publish Date: June 21, 2024

# First-Ever Brain Imaging Study on Yoga Nidra Finds Significant Changes in the Brain's Functional Connectivity during the Practice

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- Study shows how Yoga Nidra practice brings deep relaxation and increased awareness
- Yoga Nidra practice causes many changes in brain activity including in areas involved in regulating emotions, mind wandering, and sleep
- Meditators and novices respond differently to yoga nidra; meditators have reduced mental chatter during the practice
- Reduction in mental chatter is correlated with hours of yoga/meditation practice

New Delhi: In a groundbreaking collaborative effort, researchers from IIT Delhi, AIIMS Delhi, and Mahajan Imaging Delhi, have conducted the first functional MRI (fMRI) study exploring the neural mechanisms underlying Yoga Nidra. The study shows how Yoga Nidra practice brings deep relaxation and increased awareness. It also shows that more significant brain changes occur during Yoga Nidra practice in individuals with greater experience in yoga/meditation.

This work carried out at the National Resource Centre for Value Education in Engineering (NRCVEE), IIT Delhi, was supported by the Department of Science and Technology, India, under the Science and Technology for Yoga and Meditation (SATYAM) program.

Yoga Nidra practice often referred to as 'yogic sleep' or 'non-sleep deep rest (NSDR)', is designed to induce a state of deep relaxation while maintaining heightened awareness. Practitioners use it to deepen their meditative states, and several research studies have demonstrated its significant benefits for mental health. It is hypothesized that Yoga Nidra influences neural circuits involved in sleep, self-regulation, and mind-wandering. The study provides new insights into how Yoga Nidra affects brain function, in individuals experienced in meditation and yogic practices and in novices.

The Default Mode Network (DMN) is a group of interconnected brain regions that are active when we are not focused on the outside world. It's like the brain's "background mode" that operates when we are daydreaming, thinking about ourselves, or just letting our minds wander. DMN connectivity refers to how well these brain regions communicate and work together.

The study, titled "Functional connectivity changes in meditators and novices during Yoga Nidra practice" and published in prestigious international journal Scientific Reports, included two groups: 30 meditators (householders with an average of 3000 hours of experience in meditation and/or yogic practices) and 31 matched novice controls.

The study found that the Default Mode Network behaves differently (less connected) in experienced meditators compared to novices. This difference in brain communication patterns helps us understand how Yoga Nidra modulates our brain functions, promoting a state of deep relaxation while staying aware.

The study (<https://doi.org/10.1038/s41598-024-63765-7>) found a strong link between the amount of meditation and yoga practice participants had and the reduction in DMN connectivity during Yoga Nidra. In other words, the more hours participants spent practicing meditation and yoga, the more noticeable the changes in their brain activity during Yoga Nidra. These results could potentially indicate that experienced meditators have reduced mind-wandering as compared to novices, leading to changes in the DMN connectivity.

Interestingly, the study also found that while listening to the guided instructions during Yoga Nidra, both experienced meditators and novices showed activity in several parts of their brains involved in processing language and movements as expected. However, what was more interesting was activation in regions associated with processing emotions, and in the brain area Thalamus, which is involved in controlling sleep.

IIT Delhi's Prof. Rahul Garg, who is a Co-PI in this study said, "According to Yogic texts, Yoga Nidra helps bring the "samskaras" buried in deep subconscious minds to the surface and eventually helps release them, thereby promoting health. The activation of brain areas involved in processing emotions is a very interesting finding in this context". This may explain why it has been found effective in anxiety in certain studies.

Dr. Vaibhav Tripathi, currently a Postdoctoral Fellow at Harvard University who was involved in the protocol design and initial data collection highlights that the current study allows us to find both state and trait level changes in the default mode connectivity of the experienced meditators. "It could be potentially used to quantify the ability to meditate and help a practitioner track the depth of their meditative practice".

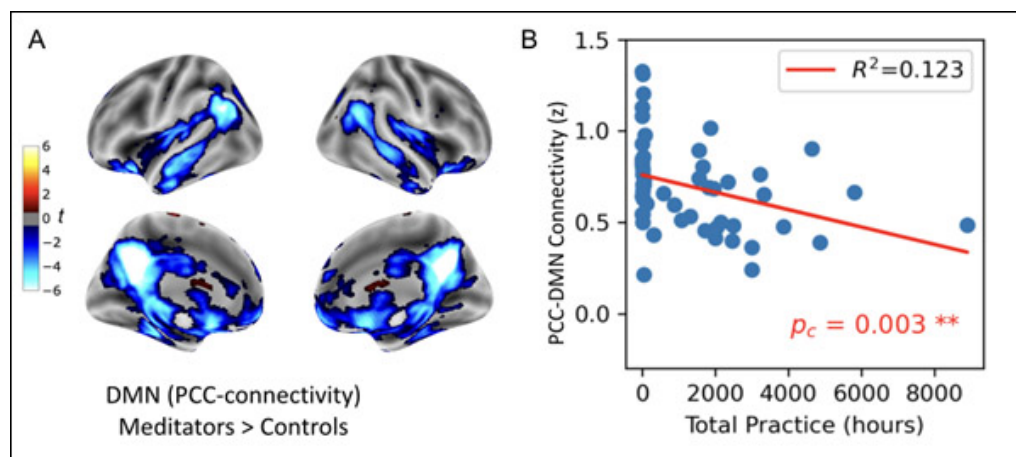


Figure depicting Functional Connectivity of Default Mode Network (PCC-node) during the last 4 minutes of Yoga Nidra. (A) Brain maps showing connectivity differences (t-values) between meditators and controls. The blue regions indicate brain areas where meditators have significantly lower connectivity than controls. (B) Scatter plot illustrating the negative correlation between total hours of meditation/yoga practice and intra-DMN connectivity during Yoga Nidra. The red line represents the trend, showing that higher cumulative practice hours are associated with greater reductions in DMN connectivity (p-value < 0.01).

## ENDS

*Manuscript Link: Functional connectivity changes in meditators and novices during yoga nidra practice*

Fialoke, S., Tripathi, V., et al. Functional connectivity changes in meditators and novices during yoga nidra practice. *Sci Rep* 14, 12957 (2024). <https://doi.org/10.1038/s41598-024-63765-7>

*Acknowledgment: The Yog Nidra used was from: Yoga Nidra - Guided Meditation for Sleep & Relaxation by Gurudev | Non-Sleep Deep Rest (NSDR)*

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