

March 2024

Exploring the Neural Correlates of Mindfulness-Based Interventions in Youth

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Recommended Citation

Jande, Jovan; Zundel, Clara; Ely, Samantha; Bhargava, Sneha; Carpenter, Carmen; Tamimi, Reem; Gowatch, Leah; Shampine, MacKenna; O'mara, Emilie-Clare; Chanamololu, Shravya; and Marusak, Hilary, "Exploring the Neural Correlates of Mindfulness-Based Interventions in Youth" (2024). *Medical Student Research Symposium*. 307.

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Mindfulness based interventions (MBI) reduce the severity of anxiety and depression among a variety of populations. While the psychological benefits of MBIs are increasingly recognized, less is known about the underlying neural correlates—particularly during childhood and adolescence, a time when many psychopathologies begin to emerge. Here, we provide the first systematic review on the neural correlates of MBI in youth. We reviewed the PubMed database for original articles examining the neural correlates of MBI in youth (0-18 years) leveraging neuroimaging. The search yielded 331 studies, of which 13 were included in the review. These studies comprised 451 participants and were summarized following PRISMA guidelines. Thirteen studies were functional magnetic resonance imaging (n=4 task-based, n=7 resting-state, n=2 graph theory) and two were structural. Most studies (n=10) included non-typically developing adolescents (e.g. familial risk for bipolar disorder) and the remainder were typically developing. Results from the studies were mixed. However, multiple studies reported reduced default mode network (DMN) activity during meditation, increased resting-state connectivity within fronto-parietal and salience networks, and increased fractional anisotropy in various white matter pathways, following a MBI. Further research is necessary to clarify the diverse ways in which mindfulness affects neural connectivity and structure in both typically developing and non-typically developing youth. This is crucial due to its potential implications for psychopathology, with hyperactivity of the DMN implicated in processes such as rumination and increased risk of depression.