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Indian Journal of Palliative Care

Letter to Editor

Meditation-induced Neuroplasticity: Implications for Cognitive Training in Heart Failure

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Dear Editor,

We read the recent article by Kumari, S., *et al.* (2025) *'Cognitive Training Intervention for Heart Failure Patients – A Randomised Controlled Trial',*[1] with great interest. Their effort to address cognitive decline in heart failure (HF) patients using a multidimensional approach is timely and commendable. Of particular relevance is the integration of breathing exercises and guided meditation into the cognitive training protocol. Meditation, particularly when combined with slow, controlled breathing, has been shown to influence cognitive function through several biological mechanisms. It promotes neuroplasticity, the brain's ability to reorganise and form new neural connections, which is essential for maintaining and improving memory, attention and executive function. Structural magnetic resonance imaging studies have revealed increased grey matter density in regions such as the prefrontal cortex, hippocampus, cingulate cortex and insular cortex following consistent meditation practice. These regions are involved in attention control, working memory, emotional regulation and interoception.[2]

Functionally, meditation enhances activity in the default mode network and strengthens connectivity between the anterior cingulate cortex and dorsolateral prefrontal cortex, supporting improved cognitive flexibility and attention regulation.[3] Meditation also reduces stress and sympathetic overactivity, downregulating the hypothalamic-pituitary-adrenal axis and inflammatory pathways. This neuroendocrine modulation may be particularly beneficial for HF patients, who often experience elevated stress hormone levels and autonomic imbalance.[4] Importantly, meditation enhances parasympathetic tone and baroreflex sensitivity, contributing to cardiovascular regulation and improved cerebral perfusion, both of which are crucial in patients with HF and associated cognitive decline.[5] By reducing perceived stress and improving emotional resilience, meditation may also create a more favourable environment for learning and cognitive rehabilitation. Incorporating meditation into cognitive training for HF patients, as done in the study, reflects a growing shift toward integrative, low-cost and patient-centred interventions.

The findings from Kumari *et al.*[1] support the potential of meditation not just as a supportive wellness tool but as a core component of cognitive health strategies in chronic illness. We encourage further studies to isolate and evaluate the independent effects of meditation in similar populations and to explore long-term outcomes using neurophysiological or imaging techniques. Such research could help refine evidence-based mind–body interventions in palliative and chronic care.

Ethical approval: Institutional Review Board approval is not required.

Declaration of patient consent: Patient's consent not required as there are no patients in this study.

Financial support and sponsorship: Nil.

Conflicts of interest: There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation: The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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Received: 07 June 2025 **Accepted:** 16 June 2025 **EPub Ahead of Print:** 14 July 2025 **Published:** 15 August 2025 **DOI:** 10.25259/IJPC_200_2025

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How to cite this article: Subha M, Prashanth S. Meditation-induced Neuroplasticity: Implications for Cognitive Training in Heart Failure. Indian J Palliat Care. 2025;31:298-9. doi: 10.25259/IJPC_200_2025