

## NEUROANATOMICAL CORRELATES OF WELLBEING IN A MINDFULNESS AND RELIGIOUS EXERCISES PROGRAM

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**Background:** Literature suggests that religiosity and spirituality experiences have specific neurobiological correlates.

**Aims:** This study aimed to identify the distinct neurobiological pathways through which mindfulness-based and religious spiritual retreats enhance wellbeing by comparing changes in brain function and structure.

**Methods:** Healthy adults ( $N=24$ ) were allocated to a mindfulness (MBSR-based) or religious retreat (Ignatian Spiritual Exercises) and underwent psychological assessments (evaluating mindfulness, religiosity, wellbeing, depression and anxiety) and structural and functional MRI scans before and after the 5-day interventions.

**Results:** Within-group analyses revealed no statistically significant changes in well-being, mindfulness, religiosity, or distress. Between-group comparisons confirmed significantly higher religiosity in the religious group. Well-being, distress and mindfulness levels were similar across groups. Also, functional brain changes: the mindfulness retreat uniquely enhanced connectivity within the executive control network, whereas the religious retreat reduced connectivity in the same network. Structurally, both groups showed increased gray matter density in left occipital cortex and fusiform gyrus, left insular cortex and left inferior frontal gyrus, compared to controls, with no significant pre-post changes observed in the self-report scales.

**Conclusions:** Both practices may contribute to improvements in well-being and reductions in distress, though short-term retreats might not produce measurable changes. Mindfulness training may strengthen top-down cognitive control, while religious practice may facilitate a de-centering process through reduced reliance on executive networks. The convergent structural neuroplasticity in both groups highlights intensive retreats as potent neuromodulators of brain neurophysiology, regarding function and structure, irrespective of their philosophical framework. This intervention appears to induce increases in gray matter volume in regions functionally involved in visual processing with semantic relevance; emotional regulation and monitoring of internal states, contributing to salience-driven attentional reorientation; as well as in speech motor planning, inhibitory control, decision-making, verbal working memory, syntactic and semantic processing, and executive control. Concluding: distinct practices can produce similar wellbeing outcomes via unique, but different neurofunctional mechanisms.

**Keywords:** Neuroanatomy, Wellbeing, Mindfulness, Religious exercises

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