

EVALUATING COGNITIVE EFFECTS OF ACOUSTIC LOOP MUSIC THERAPY IN MILD COGNITIVE IMPAIRMENT WITH MILD DEMENTIA

Findings from Home-Based Care in India | KASRC University of Kashmir

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Abstract

The prevalence of age-related cognitive impairments, particularly Mild Cognitive Impairment (MCI) associated with early-stage dementia, is increasing rapidly in India. Access to effective early-stage interventions remains limited, especially in rural populations. This study evaluates the Structured Music (SM) Model, a novel neuro-acoustic intervention designed to modulate brainwave activity through frequency-specific acoustic loops. A pilot case-control study of 100 participants (50 MCI, 50 controls) over 12 weeks demonstrated 78% cognitive improvement, 42% reduction in depression/anxiety, and 65% improvement in caregiver communication.

Introduction & Background

The prevalence of age-related cognitive impairments, particularly Mild Cognitive Impairment (MCI) associated with early-stage dementia, is increasing rapidly in India. Pharmacological treatments often provide modest clinical benefits and are constrained by high costs, limited availability, and long-term adherence challenges. Access to effective early-stage interventions remains limited, especially in rural and underserved populations. To address this gap, the present study evaluates a novel neuro-acoustic intervention: the Structured Music (SM) Model, designed to modulate brainwave activity associated with memory, attention, and emotional regulation through frequency-specific acoustic loops.

SM Model Overview

- 1.The Structured Music (SM) Model employs prescriptive acoustic modulation targeting specific cognitive and emotional domains.
- 2.Unlike conventional music therapy, it uses frequency-specific loops personalized to each patient.
- 3.Delivered via mobile applications or portable acoustic kits for home-based use.
- 4.Active caregiver participation ensures sustained engagement and structured feedback.

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RESEARCH OBJECTIVES

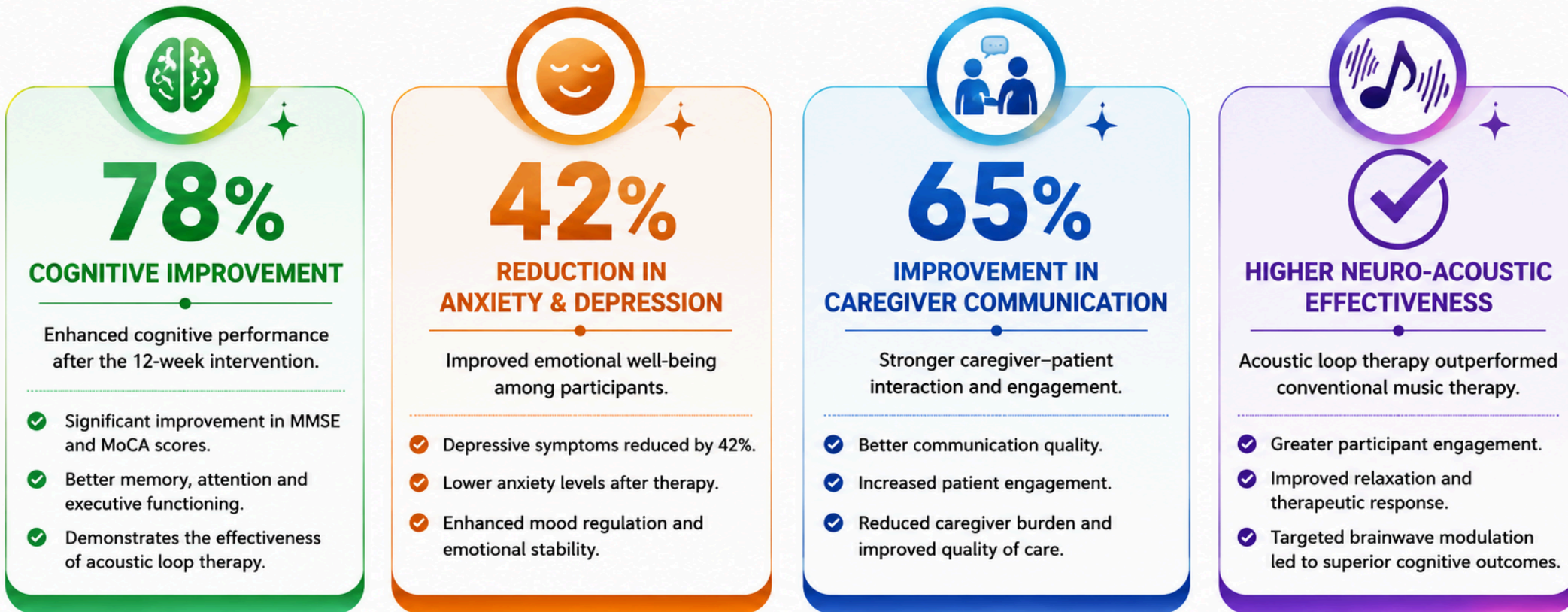
- 1 Assess the effectiveness of acoustic loop music therapy on cognitive performance in Mild Cognitive Impairment (MCI) and mild dementia.
- 2 Examine the influence of neuro-acoustic frequency modulation on emotional and behavioural responses.
- 3 Develop a caregiver-assisted home-based intervention model for sustainable dementia care.
- 4 Explore the integration of acoustic loop therapy into public health dementia-care programmes.

METHODOLOGY

#	Parameter	Description
1	Design	Pilot Case-Control Study
2	Sample Size	100 participants (50 MCI, 50 Controls)
3	Duration	12 Weeks
4	Intervention	SM Model: Frequency-specific acoustic loops delivered via mobile application or acoustic kits
5	Setting	Kashmir Advanced Scientific Research Centre (KASRC)
6	Assessment Tools	MMSE, MoCA, GDS, and Caregiver Feedback Scales
7	Variables Measured	Memory, attention, emotional regulation, and caregiver interaction
8	Statistical Analysis	Paired t-test and ANOVA for pre-post differences



KEY FINDINGS



Frequency-specific acoustic loop therapy shows significant promise as a non-pharmacological, scalable intervention to enhance cognitive, emotional, and social outcomes in individuals with MCI.

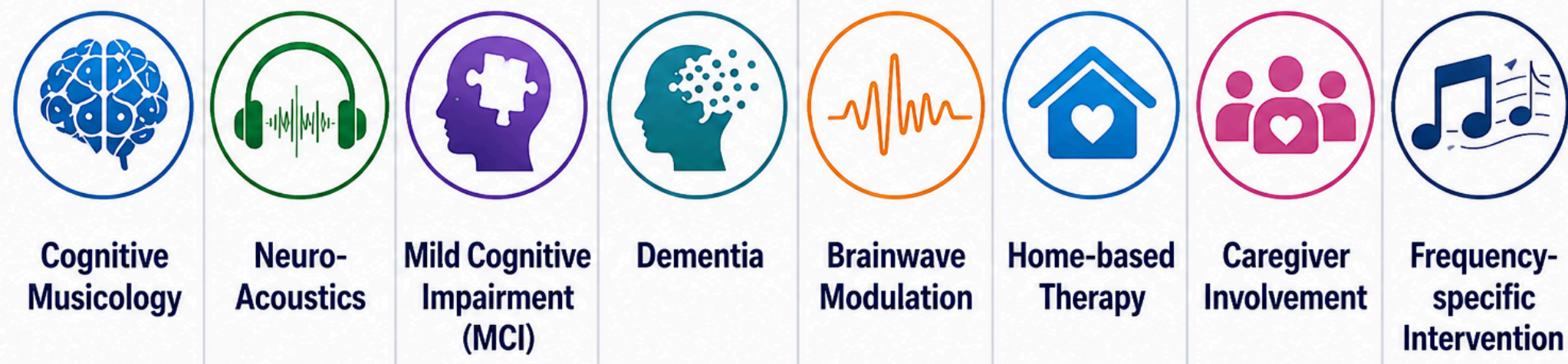
References

- Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5-TR). American Psychiatric Association. Washington, DC; 2022.
- World Health Organization. Dementia: Key Facts. Geneva: WHO; 2025.
- Alzheimer's Association. 2025 Alzheimer's Disease Facts and Figures. Alzheimer's & Dementia. 2025.
- Petersen RC. Mild Cognitive Impairment. New England Journal of Medicine. 2011;364(23):2227-2234.
- Folstein MF, Folstein SE, & McHugh PR. 'Mini-Mental State': A Practical Method for Grading Cognitive State. Journal of Psychiatric Research. 1975;12:189-198.
- Koelsch S. Brain Correlates of Music-Evoked Emotions. Nature Reviews Neuroscience. 2014;15:170-180.
- Thaut MH. Rhythm, Music, and the Brain: Scientific Foundations and Clinical Applications. Routledge; 2005.
- Clements-Cortes A. Effects of Music Therapy on Cognition and Mood in Dementia: A Systematic Review. Journal of Alzheimer's Disease. 2021.
- Shahzad Aasim, Sanjeev Rana, Rakesh Banal & Muheet Butt. Evaluating Cognitive Effects of Acoustic Loop Music Therapy in Mild Cognitive Impairment: Findings from Home-Based Care in India. Kashmir Advanced Scientific Research Centre (KASRC), 2026.

Healing Power of Music



KEYWORDS



Assessment Tools

Mini-Mental State Examination (MMSE): Cognitive screening for orientation, memory, attention, language. Montreal Cognitive Assessment (MoCA): Sensitive measure for mild cognitive impairment detection. Geriatric Depression Scale (GDS): Emotional and mood assessment. Caregiver Feedback Scales: Communication quality and patient responsiveness measures.

Discussion

The SM Model validates neuro-acoustics as a prescriptive, non-invasive intervention for early cognitive decline. Digital delivery via mobile platforms enhances feasibility in low-resource settings. Acoustic loop-based interventions facilitate cognitive network entrainment, mood regulation, and reduction of caregiver burden. Findings align with global trends toward personalized, non-pharmacological therapies in neurodegenerative disease management. The Indian home-care model addresses critical infrastructure gaps in dementia care.

Conclusion

This study validates the efficacy and feasibility of acoustic loop music-based interventions for MCI and mild dementia. The home-care approach with caregiver participation offers a sustainable, scalable dementia-care model for India. Further large-scale randomized clinical trials are recommended to standardize treatment protocols, optimize neuro-acoustic parameters, and support integration into national dementia-care policy frameworks.



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