

Virtual Reality Cognitive Training for Mild Cognitive Impairment: a Pilot Feasibility Study

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- Virtual Reality Cognitive Training (VRCT) is feasible, safe, and well-received intervention for older adults with Mild Cognitive Impairment (MCI).
- VRCT led to significantly greater improvements in visual memory and executive functioning compared to the active control group.
- Non-targeted cognitive domains (verbal memory, verbal learning and processing speed) showed decline over time in both groups.
- Targeted VRCT shows promise in enhancing specific cognitive abilities and helping mitigate further cognitive decline in MCI.

INTRODUCTION	METHODS	RESULTS	CONCLUSIONS	REFERENCES
Mild Cognitive Impairment (MCI) is a transitional stage between normal ageing and dementia, with 10–55% of individuals progressing to dementia within 2–6 years. Existing cognitive interventions are often insufficiently engaging for individuals for MCI, leading to poor adherence and limited benefits. A Virtual Reality Cognitive Training (VRCT) programme was developed with a local MedTech company DancingMind to provide an immersive, personalised and cognitively challenging intervention. This pilot study evaluated the feasibility and preliminary efficacy of a locally developed multi-domain VRCT programme in older adults with MCI.	Participants: 23 older adults with MCI were recruited from Changi General Hospital’s memory clinic (Singapore). Inclusion: Age 65–85, Petersen’s MCI criteria, MMSE ≥ 23, adequate vision/hearing, English/Chinese literate. Design: Randomised to VRCT or active control. VRCT (N=11): 10 weekly sessions consisting of psychoeducation, VR tasks (memory, attention, executive function), and relaxation modules. Active Control (N=12): 3 monthly sessions consisting of psychoeducation and a cognitive stimulation kit. Outcome Measures: Acceptability, safety, adherence, MoCA, RBANS, CTT, FAB, Everyday Memory Questionnaire.	Of 34 patients referred, 23 were enrolled and 21 completed the study. Two participants in the active control group dropped out after the second session due to COVID-19 concerns. The VRCT group demonstrated significantly greater improvements in visual memory and executive functions – specifically inhibitory control and resistance to interference – compared to the active control group. In contrast, both groups showed declines over time in non-targeted cognitive domains, including verbal learning, verbal memory, and processing speed.	This pilot study demonstrates that the VRCT programme is a feasible, safe, and engaging intervention for older adults with MCI. Preliminary findings indicate meaningful cognitive benefits in targeted domains – visual memory and executive functions. These results highlight the potential of immersive VR training to help slow cognitive decline in MCI. Larger-scale randomised controlled trials are needed to confirm efficacy, generalisability, and long-term effects.	Liu, L. Y., Lu, Y., Shen, L., et al. (2021). Prevalence, risk and protective factors for mild cognitive impairment in a population-based study of Singaporean elderly. <i>Journal of Psychiatric Research</i>, 145, 111–117. Zhang, H., Huntley, J., Bhome, R., et al. (2019). Effect of computerised cognitive training on cognitive outcomes in mild cognitive impairment: A systematic review and meta-analysis. <i>BMJ Open</i>, 9(8), e027062. Tortora, C., Di Crosta, A., La Malva, P., et al. (2024). Virtual reality and cognitive rehabilitation for older adults with mild cognitive impairment: A systematic review. <i>Ageing Research Reviews</i>, 93, 102146. Papaioannou, T., Voinescu, A., Petrini, K., & Moustafa, A. A. (2022). Efficacy and moderators of virtual reality for cognitive training in people with dementia and mild cognitive impairment: A systematic review and meta-analysis. <i>Journal of Alzheimer's Disease</i>, 88(4), 1341–1370. Bauer, A. C. M., & Andringa, G. (2020). The potential of immersive virtual reality for cognitive training in elderly. <i>Gerontology</i>, 66(6), 614–623. 