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Systematic review on computerized cognitive training (CCT) for older adults with mild cognitive impairment

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Abstract

Background: With rapid advances in technology, computerized cognitive training (CCT) is being widely used for cognitive training (CT) in elderly with mild cognitive impairment (MCI) aiming to preserve cognitive functioning. Various training protocols are developed with controversial effectiveness. Therefore, the aims of this review were to evaluate the effectiveness of CCT on cognitive and non-cognitive domains among elderly with MCI; to examine the efficacy of multi-model CCT and to determine whether it is more superior than the single-model ones; to compare CCT and traditional CT; and to provide recommendation for future studies. (Methods) A systematic review was conducted by using the following criteria: participants with mean age greater than 60 and with a diagnosis of MCI. Fifteen studies met the criteria. (Results) There is a considerable variation in study design, training content, and technologies used. The major types of technologies used included computerized software, tablets, and gaming consoles. CCT was able to bring a positive effect on global cognition in 7 out of 10 studies, on memory in all of the ten studies that evaluated it, significant effect on attention in 5 out of 6 studies and on executive function in 6 out of 12 studies. Some CCT improved non-cognitive domains such as mood and activity of daily livings. (Conclusion) CCT shows promising effect in improving cognitive function and mood among elderly with MCI, the inconsistent findings could be related to diversified training content and protocols. Multi-model CCT is shown to be more superior to single-model or traditional CT. To maximize the training effect and maintain the positive gains, CCT should be initiated before being diagnosed with dementia and incorporated into daily activities. Future studies should focus on identifying an unify protocol for CCT and adopt methods such as building rapport with participants to increase engagement level and retention rate.

Biography

Lai has ample experience in teaching, clinical service, research and administration that covered field of psychiatric and physical rehabilitation. His records of publications and conference presentations covered various important dimensions in rehabilitation sciences such as geri-orthopaedic rehabilitation, home safety and fall prevention, executive functioning, dementia, cognitive screening and care-giving stress. In recent years, Lai's research interest geared towards the implementation of holistic dementia care, which aimed not only to people with dementia but also to their care-givers. He conducts research on neuro-modulation for older people with dementia and MCI; applies Virtual Reality (VR), Augmented Reality (AR) and Artificial Intelligence (AI) for earlier cognitive screening and training; organizes public education, especially on intergeneration education for dementia care. Lai is one of the advisors of the "Dementia Care Link" which is a co-joint community volunteer training project between HA and various district-based NGOs in the community.

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