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【Practice Article】

Multimodal Exercise Program for Improvement of Cognitive Function and Brain Activation Efficiency: JAEE Research Project “Evidence from Intervention Studies”

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Abstract

We conducted a randomized controlled trial to investigate the effectiveness of a multimodal exercise program for improving cognitive function and brain activation efficiency in community-dwelling older adults. This article responds to a research project approved by the Japanese Association of Exercise Epidemiology “to promote the creation, communication, and utilization of evidence from intervention studies in Japan”. We aimed to demonstrate evidence for the effectiveness of a multimodal exercise program for improving cognitive function and brain activation efficiency, and discuss its generalizability through the RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) framework. Participants in this program were limited because of small sample size. However, participant’s characteristics were relatively average level (“reach”). The “effectiveness” of this program was validated by the improvement of the efficiency of brain activation during cognitive tasks and increase of physical activity, which is associated with improvements in memory and executive function. The “adoption” appears to be good as the equipment and location of the intervention were relatively common. However, we have not evaluated it scientifically. Furthermore, future study is required to verify the “implementation” and “maintenance” of this program. Although challenges remain to be addressed, this was verified as an effective and practicable short-term exercise program for cognitive improvement, which is expected to be actively utilized for care prevention practice.

Key words: older adults, exercise, cognitive function, fMRI

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