

Effects of Exercise on Cognitive Function in Depressed Adults: Systematic Review and Network Meta-analysis

Ping Jiang, Lin Wang, Lei Zhang, Li Duan*

Department of Health Management, Chengde Medical University, Chengde, China

Email address:

15690163406@163.com (Ping Jiang), dfhedianren@163.com (Li Duan), 912338879@qq.com (Lei Zhang)

*Corresponding author

Abstract

World Health Organization projections estimate that depression will become the leading cause of disease burden worldwide by 2030. In China, the world's largest developing country, the lifetime prevalence of adult depressive disorder is about 6.8%, of which 3.4% is depression. In recent years, cognitive dysfunction remains a crucial clinical symptom, affecting the course and prognosis of the disease. studies on the effects of exercise on cognitive function in depressed adults have produced inconclusive results, and few network meta-analyses have concentrated specifically on cognitive dysfunction patients. Moreover, cognitive function is generally investigated only as a secondary outcome target, and issues such as non-standardized reporting, incomplete data, and straightforward assessment methods have resulted in inaccurate therapeutic effects and a lack of systematic generalization from evidence-based concepts for specific exercise prescription parameters. Thus this review investigated the effectiveness of exercise on global cognition, memory, and attention in adult patients with depression, regardless of the presence of cognitive dysfunction. The study also evaluated the optimal exercise interventions based on network meta-analysis. This study is registered with PROSPERO, CRD42024551037. Eleven relevant databases were searched (inception to May 2024) and ultimately included 35 studies. Primary outcome was global cognitive function, and secondary outcomes included memory and attention. Pooled standardized mean differences or odds ratios with 95% credible intervals were estimated using pairwise and network meta-analysis with random effects. Differences among trial findings were explored in subgroup and sensitivity analyses. The Cochrane Risk of Bias Tool assessed the risk of bias in the randomized controlled trials. Quasi-experimental studies were evaluated according to the JBI Health Care Center 2016 version of the evaluation tool. The comprehensive pooled results indicated that exercise could significantly improve global cognitive function (standard mean difference = 0.74, 95% CI: 0.62, 0.86) and other cognitive domains. Specifically, mind–body exercises demonstrated the strongest effects on global cognitive function with a Surface Under the Cumulative Ranking Curves (SUCRA) value of 84.0% and memory (86.2%), while the most substantial impact on improving attention was from resistance exercise (63.1%). By subgroup analysis, this study also found that mind–body exercise for 30 minutes/session was the most effective in improving global cognitive function. Despite some heterogeneity, this study's findings provide preliminary yet cautionary evidence that exercise improves cognitive function in adults with depression. These findings can support clinical practice, but further studies are needed to position exercise training within evidence-based intervention approaches.

Keywords

Depression, Cognitive Dysfunction, Exercise, Interventions, Network Meta-analysis

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