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Reference Materials

Title: **Physical exercise and cognitive performance in the elderly: current perspectives**

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Abstract:

In an aging population with increasing incidence of dementia and cognitive impairment, strategies are needed to slow age-related decline and reduce disease-related cognitive impairment in older adults. Physical exercise that targets modifiable risk factors and neuroprotective mechanisms may reduce declines in cognitive performance attributed to the normal aging process and protect against changes related to neurodegenerative diseases such as Alzheimer's disease and other types of dementia.

In this review we summarize the role of exercise in neuroprotection and cognitive performance, and provide information related to implementation of physical exercise programs for older adults. Evidence from both animal and human studies supports the role of physical exercise in modifying metabolic, structural, and functional dimensions of the brain and preserving cognitive performance in older adults. The results of observational studies support a dose-dependent neuroprotective relationship between physical exercise and cognitive performance in older adults. Although some clinical trials of exercise interventions demonstrate positive effects of exercise on cognitive performance, other trials show minimal to no effect. Although further research is needed, physical exercise interventions aimed at improving brain health through neuroprotective mechanisms show promise for preserving cognitive performance. Exercise programs that are structured, individualized, higher intensity, longer duration, and multicomponent show promise for preserving cognitive performance in older adults.

Keywords: aging, neurodegeneration, dementia, brain, physical activity

Conclusion

Physical exercise that targets modifiable risk factors and neuroprotective mechanisms provides a nonpharmacological approach to slowing age-related decline and reducing disease-related cognitive impairment in older adults. **Higher doses of physical exercise are associated with reduced risk for cognitive impairment and dementia.** Studies provide compelling evidence that exercise can modify metabolic, structural, and functional dimensions of the brain that preserve cognitive performance in older adults. Further research is needed to identify the most beneficial aspects of exercise programs; however, evidence supports structured, longer duration, and multicomponent exercise programs for enhancing cognitive performance and overall function in older adults.