

## Exercise Epidemiology on Cognitive Function and Brain-derived Neurotrophic Factor

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### Abstract

Dementia represents a major health problem that impacts people's ability to maintain occupational and social function. Brain-derived neurotrophic factor (BDNF) plays important roles in the growth, development, maintenance and function of several neural systems as well as in modulating neurotransmission, in activity-directed synaptic remodeling and neurogenesis. In this review, we firstly summarized the effect of exercise on dementia and related cognitive function in human, and secondarily described the mechanism by which exercise increased levels of BDNF and BDNF mRNA expression in the brain. In meta-analysis (Heyn P, et al., *Arch Phy. Med Rehabil*, 85, 1694,2004), it is suggested that exercise training increased physical fitness, physical function, cognitive function, and positive behavior in elderly people with dementia and related cognitive impairment as well as Alzheimer's disease. In animal study, it is demonstrated that voluntary exercise increases BDNF protein and BDNF mRNA expression in the brain. Possible intercellular pathway for exercise-induced increases in BDNF is also discussed in this brief review.

**Key words:** nerve growth factor, brain-derived neurotrophic factor, elderly, cognitive function, physical training

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