

## A SYSTEMATIC REVIEW OF RANDOMIZED CONTROLLED TRIALS OF COGNITIVE TRAINING INTERVENTIONS IN OLDER ADULTS

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There has been a growing interest in cognitive training interventions for their potential effect of maintaining and promoting cognitive functioning in older adults. Rapid and significant changes in technology has had a significant impact on the design and assessment methods of cognitive training interventions. Investigating changes in brain networks and blood markers are relatively new approaches and sparsely examined in the literature. The purpose of this systematic literature review is to analyze the effect of cognitive training interventions on brain networks, blood markers and associated cognitive performance of healthy older adults. We conducted a comprehensive literature search on four databases, following PRISMA guidelines. Initially, 2426 citations were retrieved, and 251 full-text publications were evaluated in detail for eligibility. Fourteen randomized control trials were included in this review. Functional imaging analysis of brain networks showed significant activity changes primarily in the Default Mode Network. These changes were associated with improvement in memory, learning, attention, and affective performances. Also, there were activity changes in the Central Executive Network that were associated with improvement in reasoning, attentional control, innovative thinking, and processing speed. Training-induced changes have been observed in the brain-derived neurotrophic factor levels and the markers of antioxidative and anti-inflammatory regulatory mechanisms. Improvement in attention and memory performances were significantly related to these changes. Limitations of the studies included methodological inconsistencies, sampling issues, and the lack of long-term follow up assessment. Cognitive training appears to promote improvement and maintenance of cognitive functioning in healthy older adults.

## THE ASSOCIATION OF MILD TBI WITH EARLY ONSET DEMENTIA IN POST-9/11 VETERANS

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Evidence produced by studies using ICD-9 codes to identify dementia suggests that mild traumatic brain injury (mTBI) can accelerate age-related neurodegeneration and dementia risk. However, ICD-9 codes are unreliable in identifying early onset dementia (<65 years; EOD) in civilian (positive predictive value [PPV]=58%) and VA

(PPV=28%). From 1,724 Veterans <65 years of age with 2 or more dementia diagnoses based on ICD-9 codes recommended by VA Dementia Steering Committee, we validated dementia diagnoses in 153 randomly selected cases using medical chart abstractions and reviews by a neuropsychologist panel. We matched valid cases based on age, sex, race/ethnicity, year of entry to VA care, and branch of service to 2490 controls with no indicators of dementia or cognitive impairment. TBI severity was defined using multiple DoD and VA data sources. We also identified diagnoses for mental (e.g., depression, post-traumatic stress disorder, substance use disorders) and other medical conditions (e.g., stroke) associated with dementia. We used conditional logistic regression to examine the association of TBI severity with EOD controlling for comorbidity. After controlling for mental health and other comorbid conditions mild TBI (mTBI) was significantly associated with validated EOD [aOR( 95%CI): mTBI-4.5(2.4-8.9), moderate/severe TBI-21.3(8.4-54.3)]. Stroke, depression, PTSD, and headache were also associated with higher odds of EOD. These findings suggest that Veterans with mTBI are at risk for dementia, and clinicians should consider brief screening for cognitive dysfunction to ensure that they receive timely treatment to mitigate and address the impact of dementia on the individual, caregiver, family, and health care system

## PREDICTORS OF LONGITUDINAL COGNITIVE DECLINE AMONG COMMUNITY-DWELLING KOREAN OLDER ADULTS

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Objective This study aims to explore predictors to longitudinal decline of cognitive function in old adults in Korean. Methods The data were derived from the information system of the Korean Longitudinal Study of Aging (KLoSA) which performed nationwide aging panel survey for adults aged over 45 years between 2006 and 2016. The sample consisted of 1,262 older adults who completed K-MMSE. Of the total 1,262 participants, 752 had normal cognition, 243 had mild cognitive impairment, and the rest 267 had dementia. Variables from diverse dimensions were derived from the KLoSA. The linear mixed models were used to predict and explain predictors affecting cognitive function decline over time. Results The ADL and IADL, depression, exercise, and social activity were time-varying variables significantly related to the cognitive function of the older adults. Over time, difference in change of the K-MMSE score between three groups was significant. Conclusions This study identified predictors influencing decrease of cognitive function over time in older adults in Korea. Tailored intervention needs to be developed and implemented in order to delay the cognitive function decline. Improving physical function through regular exercise, increasing social activity, and managing depression by early detection and treatment are recommended according to the cognitive function status. Keywords: old adults, cognitive function, K-MMSE, predictor