

Thesis Abstract

No. _____

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Thesis Title Hand dexterity, not handgrip strength, is associated with executive function in Japanese community-dwelling older adults: a cross-sectional study (握力ではなく、手先の巧緻性は地域在住高齢者の実行機能に関連する)			
Thesis Summary An association between handgrip strength, hand dexterity and global cognition is suggested; however, it is unclear whether both hand motor functions are associated with executive function, which is important for performing daily activities. A better understanding of this association in older adults without cognitive impairment would help identify motor risk factors for impairment of executive function in late adulthood. The purpose of this study was to investigate the relationship of handgrip strength and hand dexterity with executive function in physically and mentally healthy community-dwelling older adults. Three hundred and twenty-six right-handed older adults (287 women, mean age \pm SD, 70.1 \pm 5.6) underwent handgrip strength and hand dexterity tests using a hand dynamometer and the Purdue Pegboard Test (PPT), respectively. Executive function was evaluated with the Trail Making Test (TMT)-A, TMT-B and Digit symbol; global cognition was assessed with the Mini-Mental State Examination (MMSE). Age-group differences showed that the younger groups (60–64, 65–69 and 70–74) had a significant better PPT ($p < 0.001$) and executive function performance ($p < 0.001$) than the oldest group (75 and older), whereas no significant age differences were observed for handgrip strength ($p = 0.104$). Multiple regression analysis adjusted for potential covariates, including MMSE scores, showed that TMT-A ($p < 0.001$), TMT-B ($p < 0.05$), and Digit symbol ($p < 0.001$) were significantly associated with PPT scores; however, no significant association was observed between executive function variables and handgrip strength. The results revealed that hand dexterity assessed by PPT performance, and not handgrip strength, was significantly associated with executive function among high-functioning older adults. These findings suggest that hand dexterity is vulnerable to the effects of aging and may be considered a measurable motor risk factor for the early detection of executive function impairment among older adults with intact global cognitive performance. These findings also provide a reasonable basis for implementing hand dexterity interventions for the prevention of executive function impairment in community-dwelling older adults.			