

exercise-related activities from a self-reported PA questionnaire. Group one expended less than 3,000 calories per week and group two spent more than 3,000 calories per week performing PA. The selected measures of functional fitness were a 4-m gait speed (GS), 30-s chair stand test (CS-30), 2-min step test (ST), and the 8-foot up and go test (GUG). Data were analyzed using a one-way ANOVA. There was a statistically significant difference between the groups on GS ( $F_{1, 24} = 9.29, p < .01$ ) and CS-30 ( $F_{1, 24} = 4.37, p = .05$ ). The results yielded a trend for the GUG ( $p = .06$ ). However, there was not a difference between the groups on the ST ( $p = .11$ ). These results suggest older adults expending more than 3,000 calories per week performing PA walk faster and have greater lower-body strength.

#### INTER-INDIVIDUAL DIFFERENCES IN EXERCISE RESPONSES IN ALZHEIMER'S DISEASE

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Aerobic exercise is widely supported as a disease-modifying treatment for Alzheimer's disease (AD) in animal models; however, its effects on cognition have been mixed in human studies, which may be attributable to inter-individual differences in aerobic fitness and cognitive responses to aerobic exercise. This study evaluated inter-individual differences in aerobic fitness and cognitive responses to 6-month aerobic exercise in participants with AD dementia by secondarily analyzing the FIT-AD Trial data. Aerobic fitness with the shuttle walk test (SWT), 6-minute walk test (6MWT), and maximal oxygen consumption ( $VO_{2max}$ ) from cycle-ergometer exercise test, and cognition with the AD Assessment Scale–Cognition (ADAS-Cog). Inter-individual differences were calculated as the differences in the standard deviation of 6-month change (SDR) in outcomes between the intervention and control groups. The sample size was 78 (77.4±6.3 years old, 15.7±2.8 years of education, 41% women).  $VO_{2max}$  was available in 26 participants (77.7±7.1 years old, 14.8±2.6 years of education, 35% women). The results show that the SDR was 37.0, 121.1, 1.7, and 2.3 for SWT, 6MWT,  $VO_{2max}$ , and ADAS-Cog, respectively, but there were no statistically significant differences between the intervention and control groups in these measures over six months. Our results indicate that inter-individual differences exist in aerobic fitness and cognitive responses to aerobic exercise in AD, which contributed to the favorable, but not statistically significant between-group differences in aerobic fitness and cognition. To conclude, our study is the first to demonstrate inter-individual differences in the responses to aerobic exercise in AD dementia using SDR.

#### IS HANDGRIP STRENGTH A VALID AND RELIABLE MEASURE IN OLDER ADULTS?

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Handgrip strength is related to mortality, disability, functional independence, and quality of life in older adults, and cut points for diagnosis of sarcopenia have been proposed.

However, there is no standardized procedure or device, so measurement may not be accurate. To assess validity and reliability we compared hydraulic (HD) versus digital (DD) handgrip dynamometers. Sixty-seven older (76.2 ± 0.9 years) men (n=34) and women (n=33) completed two measurements on sequential days (T1, T2) using both devices in random order. Participants sat in a chair with the device held in their dominant hand, their arm supported on a table or other stable surface, their wrist in a neutral position, and their elbow bent at a 90° angle. To avoid muscle fatigue that has been attributed to multiple attempts, participants squeezed the device one time as hard as possible for 3 seconds. Strong ( $p < 0.001$ ) intraclass correlations were observed for both devices (HD=0.98; SS=0.96) indicating good reliability. However, there were significant differences between devices and between measurements. Strength measured with HD was greater than DD at T1 (27.4 ± 1.4 vs. 23.4 ± 1.1 kg,  $p < 0.001$ ) and T2 (25.3 ± 1.4 vs. 21.8 ± 1.2 kg,  $p < 0.001$ ). Day-to-day measurements were also significantly different. Between T1 and T2 strength decreased 8% with HD ( $p < 0.001$ ) and decreased 7% with DD ( $p = 0.001$ ). In this group of older adults, significant differences in handgrip strength were observed between devices and timepoints indicating poor validity. As a diagnostic tool, standardization is needed for handgrip measurement procedures to improve accuracy.

#### MINDFULNESS MEDITATION AND TAI CHI CHUAN ON SLEEP DISTURBANCE IN CHINESE OLDER PEOPLE: A RANDOMIZED CONTROLLED TRIAL

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Sleep disturbances are common during the aging process and can result in a reduced quality of life. Many older people who experience sleep disturbances would consider turning to complementary and alternative medicine (CAM) due to the limitations of traditional pharmaceutical or psychological and behavioural treatments. Mindfulness Meditation (MM) and Tai Chi Chuan (TCC) are two common forms of mind-body based CAM. The former focuses more on mind-based practices whereas the latter emphasizes predominantly on body or movement-based practices. An etiological model of sleep disturbance (Shallcross et al., 2019) can lay the groundwork for a better understanding of the mechanisms of MM and TCC in relation to sleep disturbances. This study aims at comparing the effects of MM and TCC with Sleep Hygiene Education (SHE) control group. A three-armed randomized controlled pilot trial was conducted involving 45 community-dwelling older adults aged 65 to 82 with symptoms of sleep disturbance. Moderate effect sizes (Cohen's  $d = 0.7$  and  $0.56$ ) were found for the primary outcome of insomnia severity at post-intervention as comparing MM and TCC groups with SHE control group, respectively. More specific, participants in the MM group showed more amelioration on mental health status, introspective awareness, and objective measure of EEG-based brain arousal level; whereas participants in the TCC group showed better improvement on physical health status and subjective measure of hyperarousal. Findings

demonstrate the unique therapeutic effects of MM and TCC on improving sleep problem in older people. The application in a Chinese context will be discussed.

#### POST-ACUTE REHABILITATION IN PERSONS WITH DEMENTIA: DOES IT MAKE A DIFFERENCE?

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Persons with dementia are about two times more likely to be hospitalized than their peers who are cognitively healthy. These individuals are frequently discharged to skilled nursing facilities or nursing home settings, to receive short-term, post-acute, rehabilitative care. The rehabilitative care, Physical Therapy (PT) and Occupational Therapy (OT), provided in skilled nursing facilities (SNFs) aims to restore the person to their pre-hospitalization functional status and assist the person to return home. This study used MDS assessment data of 6396 people, age 65 years and older with dementia, admitted to SNFs in 2013 from acute care hospitals in Massachusetts to assess the effects of OT and PT on the change in physical function of nursing home residents admitted to the nursing home after hospitalization. Multiple linear regression analyses. The sample was mostly female (64.1%), non-Hispanic (98.86%), and white (93.71%), with a mean age of 85.3 (SD=6.85). After controlling for age, gender, race and comorbidities, and delirium, rehabilitation interventions (OT, PT or OT+PT) did not have any significant effect on changes in physical function among residents with dementia ( $p$  for OT = 0.14;  $p$  for PT=0.59;  $p$  for OT+PT:= 0.32). Additionally, non-white residents had poorer function at three months ( $\beta$ =1.86, 95% CI:-3.57- -0.16). The results indicate for persons with dementia admitted to SNFs, OT, PT or OT+PT did not lead to a significant improvement physical function. More innovative and effective interventions should be developed to improve physical function in persons with dementia post-hospitalization.

#### PREFRONTAL CORTEX HEMODYNAMICS DURING EXERCISE IN OLDER ADULTS WITH MOTORIC COGNITIVE RISK SYNDROME

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The motoric cognitive risk syndrome (MCR) is a recently described pre-dementia syndrome in older adults characterized by slow gait coupled with subjective cognitive complaints. While previous studies have demonstrated the benefits of exercise on cerebral hemodynamics in healthy older adults, to date, no study has characterized the effects of exercise on these parameters among more vulnerable older persons with MCR. To address this knowledge gap, we investigated how the brain area responsible for high-order cognitive function (i.e., prefrontal cortex) is affected

during acute cycling exercise in 19 older adults with MCR (Age (mean  $\pm$  SD): 73.7  $\pm$  7.1 years; BMI: 32.1  $\pm$  5.5 kg/m<sup>2</sup>; gait speed: 0.55  $\pm$  0.1 m/s; Modified Mini-Mental score: 91.8  $\pm$  6.8; 74% female). Participants performed an incremental submaximal cycling test and we used functional near-infrared spectroscopy to assess changes in concentrations of Oxyhemoglobin (O2Hb), Deoxyhemoglobin (dHb) and total hemoglobin (Hbt) during exercise. Results showed that participants cycled for 4.9  $\pm$  0.5 minutes, achieved a submaximal load of 54.7  $\pm$  17.3 watts, a peak exercise heart rate of 95.7  $\pm$  14.7 beats/min and a rate of perceived exertion (13.8  $\pm$  2.0). Compared to baseline, there was an increase of 97.3 % in the O2Hb, 86 % on the Hbt and an 87.9 decrease of dHb while exercising. Our findings suggest that acute exercise at light through moderate intensity increases prefrontal cortex oxygenation in older adults with MCR. Additional studies are also warranted to characterize the effects of chronic exercise on cerebral hemodynamics in at-risk older adults.

#### RELATIONSHIP BETWEEN PHYSICAL ACTIVITY AND FUNCTION WITH QUALITY OF LIFE IN COMMUNITY-LIVING OLDER ADULTS

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Background: Quality of life (QOL) is a multidimensional concept which is often used as an evaluation of a person's health and psychological status. Increasing longevity can be associated with better QOL as long as older adults are independent in daily life. The aim of the study was to examine the associations of QOL with muscle strength and physical function among community-dwelling older adults. Methods: The current cross-sectional study had 225 participants (73.7 $\pm$ 5.7yrs, 58.2% female) living in Reykjavik, Iceland. QOL measured using the 36-item short-form survey (SF-36). Covariates were anthropometrics, muscle strength, physical function including timed up and go test (TUG), and 6-minute walking distance (6MWD), physical activity per week (PA). Linear regression analysis was used to examine the association of QOL with physical function. Results: The mean QOL score for the study population was 54.9 $\pm$ 6.13. The analysis was adjusted for age and gender, body mass index, height, and PA. We found that QOL was associated with better grip strength (B=1.4, P<0.0001), 6MWD (B=0.03, P<0.0001), slower TUG (B=-0.9, P<0.0001), and higher PA (B=0.03 m, P=0.039). However, QOL was not associated with quadriceps leg strength. Conclusion: The study suggests that QOL was associated with better physical function including grip strength, walking ability and the level of PA among community-dwelling older adults in Iceland.

#### SATISFACTION WITH OUTDOOR ACTIVITIES OVER TIME AMONG LONG-TERM SERVICES AND SUPPORTS RECIPIENTS

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