

cognitive impairment. This study aimed to examine the effect of Tai Chi-based exercise program on cognitive function among older adults with early dementia. Individuals registered at the Dementia Support Center were invited to participate in the Tai Chi-based exercise program twice a week for one-hour session for 20 weeks. The comparison group with the same inclusion criteria but not participated in any formal exercise program were recruited by matching with age, education, and pre-cognitive function. Cognitive function (MOCA-K) was measured at the pretest and at the completion of the study period. Fifty-two older adults with dementia (29 in Tai Chi group, 23 comparisons) with the mean age of 80.5 years completed all measurements. All participants had at least one chronic disease. About 50% of the participants received no formal education. At the completion of the study, Tai Chi group improved their cognitive function, while their counterpart remained similar in their MOCA-K score, specifically in attention ($F=5.21, p=.027$) and short term memory recall ($F=6.66, p=.013$). In conclusion, Tai Chi-based exercise program was safely and effectively applied to older adults with early dementia. The participants were able to follow the movements with the attendance rates of 80% during the study period. Further studies are warranted to explore the relationship between physical exercise and cognitive function in this population with various types of cognitive impairment.

EFFECTS OF RESISTANCE EXERCISE ON MENTAL HEALTH IN OLDER CHINESE AMERICANS: A RANDOMIZED CONTROLLED TRIAL

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Regular exercise has shown to be potentially beneficial for improving mental health in older adults. However, few studies evaluated the effect of resistance exercise on psychological well-being in older Chinese Americans. The purpose of this two-arm randomized controlled trial (RCT) was to test the effects of resistance exercise training on stress, depression, and social engagement in community-dwelling older Chinese Americans. A total of 30 older adults (mean age 77.9 ± 5.0 years) were randomly assigned into the resistance exercise intervention group ($n = 15$) or the wait-list control group ($n = 15$). The resistance training intervention includes 50-min group exercise session twice weekly for 12 weeks. Participants' perceived stress, depressive symptoms, and social engagement were measured at baseline and 12 weeks follow-up. Descriptive statistics and t tests were performed for data analysis. The results revealed that the resistance exercise intervention group had significant improvements in perceived stress, depressive symptoms, and social engagement after receiving the 12-week intervention. At baseline, there were no significant differences between the intervention and the control groups on perceived stress, depressive symptoms, and social engagement. However, older adults received resistance exercise training had greater improvements in stress levels, depressive symptoms, and social engagement than their control counterparts at 12 weeks follow-up. The findings suggest resistance exercise has positive effects on psychosocial well-being for older adults. Further larger RCTs

are needed to assess long-term effects of the resistance exercise intervention.

FEASIBILITY OF A GROUP VERSION OF THE LIFESTYLE-INTEGRATED FUNCTIONAL EXERCISE PROGRAM

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In a randomised noninferiority trial, it is investigated whether a group version of the Lifestyle-integrated Functional Exercise program (gLiFE) is non-inferior to the individually delivered LiFE in terms of feasibility and effectiveness. While effectiveness evaluation is ongoing, feasibility results are already available. Participants (>70 years; confirmed fall risk) were randomized in either LiFE or gLiFE and participated in the same strength and balance exercises, however, based on different approaches of delivery. LiFE participants received seven home visits; gLiFE was delivered in seven group sessions. Feasibility was defined as willingness to participate, adherence to group/home visits, and drop-outs. Predictors for intention to participate were calculated using regression. $N=310$ participants were randomized to LiFE ($n=156$) or gLiFE ($n=154$). $n=51$ (16%) of the participants dropped out after baseline. Attendance analyses showed that when excluding drop-outs, 100% (iLiFE) and 88% (gLiFE) took part in at least 5 of the 7 meetings. Self-efficacy and outcome expectancies, but not risk perception, were predictors of the intention to participate ($F(3,193)=24.84, p<.001$). In this first study comparing a group-based LiFE format with the original LiFE, feasibility of both formats was shown in terms of high attendance and less drop-outs than expected in this target group. Compared to other studies involving group based training, compliance to intervention (defined as having absolved at least 5 sessions) was high in both formats. Lower attendance in gLiFE can be explained by inflexible scheduling as compared to making individual home visit appointments. Whether lower gLiFE adherence translates into lower effectiveness is currently analysed.

INFLUENCE OF PHYSICAL ACTIVITY ENERGY EXPENDITURE ON FUNCTIONAL FITNESS AMONG OLDER ADULTS

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Remaining physically active as one ages plays a critical role in maintaining health and improving functional capacity. Further, older adults can see additional health-related benefits by increasing intensity, duration, frequency, and/or levels of physical activity. However, there is limited research examining physical activity energy expenditure (PAEE) and measures of functional fitness. Therefore, the purpose was to examine differences between older adults with varying levels of PAEE on selected measures of functional fitness. A sample of 25 adults (age: 74.0 ± 7.1 years) were recruited from an urban area and divided into two groups. PAEE was calculated using the total caloric expenditure per week for all

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