

Physical inactivity and loss of muscle mass, strength, and function are associated with negative outcomes including disability and a decline in health-related quality of life (HRQoL) among older adults. Older adults living in continuing care retirement communities (CCRCs) are at greater risk for declining physical activity and muscle outcomes compared to community-dwelling older adults. Few researchers studying the association of muscle and physical activity have examined the distinction between physical and mental HRQoL. Understanding the differential association of physical and mental HRQoL to physical activity and muscle outcomes can inform the development of useful interventions. The aim of this study was to examine the relationships between physical activity, muscle mass, strength, function and physical and mental HRQoL. Using a descriptive, correlational design, 105 older adults living in CCRCs were recruited. Light physical activity (LPA), moderate physical activity (MPA), sedentary behavior, and steps per day were assessed using ActiGraph GT3X. Appendicular skeletal muscle mass (ASMM) was assessed with bioelectrical impedance spectroscopy, handgrip strength with JAMAR Smart Hand Dynamometer, muscle function with the Short Physical Performance Battery (SPPB) test, and physical and mental HRQoL with the SF-36 questionnaire. The mean age of participants was 83 (SD=7.4). Using multiple regression models adjusted for sex and age, steps per day and SPPB score explained 38.4 % of the variance in physical HRQoL. Handgrip strength explained 8 % of the variance in mental HRQoL. These findings suggest that QoL improvement programs should include components to improve physical activity, muscle strength and function.

CONTRACTION TYPE INFLUENCES CRITICAL AGES FOR DECLINES IN LOWER BODY SPECIFIC FORCE IN WOMEN AGES 20 TO 89 YEARS

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The ability for a muscle to produce force relative to its size, specific force, is an important characteristic for healthy aging. Few studies have identified the influence that different muscle groups or contraction types may have on the onset of declines in specific force. Therefore, the aims of the current study were to identify critical ages for changes in upper (quadriceps and hamstrings) and lower leg (soleus and tibialis anterior) specific force and to determine if the onset of decline is influenced by contraction type (isometric or dynamic) in women aged 20 to 89 years. One-hundred and fifty-two women (47.1±17.7years, 164.2±7.0cm, 67.1±10.7kg) matched for physical activity with approximately 10 participants per five-year interval (20-24, 25-29years, etc.), were included in the present analysis. Specific force was calculated from peak torque values measured from isometric (ISOM) or isokinetic testing (60deg/s and 240deg/s) and made relative to muscle area measured by peripheral quantitative computed tomography. An iterative segmental modelling approach was performed to identify critical age periods for changes in specific force. For the upper leg, ISOM and 60deg/s specific force was maintained across the lifespan, whereas 240deg/s revealed a critical age of 35.2±5.3years. Critical ages were identified for all contraction types for the lower leg and occurred earlier with increasing velocity (ISOM: 63±6.6years,

60deg/s: 53.9±4.5years, and 240deg/s: 49±3.9years). These data suggest that muscle groups of the leg do not display uniform changes across different contraction types and that high velocity contractions display earlier declines across the lifespan.

CUMULATIVE EFFECTS OF PHYSICAL ACTIVITY, DIETARY VARIETY, AND SOCIAL PARTICIPATION ON ACTIVE LIFE EXPECTANCY

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Regular physical activity, dietary variety, and active social participation are modifiable and influential factors of adverse health outcomes. However, the cumulative effects of these behaviors are unknown. We examined these cumulative associations with active life loss in older adults. We analyzed 3-year longitudinal data from 7246 initially non-disabled residents aged 65-84 years from 18 districts of Ota City, Tokyo. Sufficiency of moderate- to vigorous-intensity physical activity (MVPA) of ≥150 minutes/week, dietary variety score (DVS) of ≥3, and social participation of ≥1 time/month were assessed using self-administered questionnaires. We operationally defined active life loss for individuals as being newly certified for long-term care insurance or death without prior certification. Multilevel survival analyses were applied to calculate hazard ratios (HRs) and 95% confidence intervals (CIs). During an average follow-up of 2.9 years, the cumulative incidence of active life loss was 11.3% (817 individuals: 650 new certifications and 167 deaths without prior certification). Multivariate-adjusted HRs (95% CIs) for active life loss were 0.73 (0.58-0.92) in only MVPA of ≥150 minutes/week, 0.88 (0.67-1.15) in only DVS of ≥3, 0.75 (0.51-1.09) in only social participation of ≥1 time/month, 0.56 (0.45-0.70) in the group satisfying any two, and 0.52 (0.40-0.67) in the group satisfying all three behaviors, compared with a reference group that did not satisfy any of the behaviors. Sensitivity analysis that excluded active life losses during the first year showed similar results. The combination of regular physical activity, dietary variety, and social participation further enhances the effects on active life expectancy than individual practices.

EFFECT OF A TAI CHI-BASED EXERCISE PROGRAM ON COGNITIVE FUNCTION AMONG OLDER ADULTS WITH DEMENTIA

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Cognitive function with dementia is strongly associated with physical function decline. A low intensity aerobic exercise, such as Tai Chi, may help either prevent or slow down