For older adults, the maintenance of muscle power and balance is a key factor in everyday task performance. Understanding the effects of emerging training modalities such as power training (PT) and multicomponent training (MT) compared to traditional resistance training (TRT) is of benefit to this age group.

**PURPOSE:** To investigate the effects of 20-weeks of PT, MT, and TRT using variable resistance (elastic bands with loops) on physical function in older women (OW).

**METHODS:** 136 sedentary OW (68.09 ± 4.78 yr) were randomized into PT (n=34), MT (n=34), TRT (n=34), and control groups (CG) (n=34). All exercise groups trained twice weekly for 20 weeks. PT performed 6 exercises, 3-4 sets of 10 repetitions, at a 4 rate of perceived exertion (RPE) in the first repetition and no more than 6 in the last. MT performed balance, muscular endurance (2 exercises, 3-4 sets of 15 repetitions at 7-9 RPE), aerobic, flexibility, and coordination exercises. The TRT performed 6 exercises, 3-4 sets of 6 repetitions at 7-9 RPE. Variables analyzed were static balance (Romberg), agility (Up & Go), gait speed (4m), muscle strength (30s chair stand), and aerobic capacity (6-minute walk test). Trial (2) by group (4) repeated measures ANOVA was used to determine differences regarding time and groups.

**RESULTS:** MT showed significant improvements (p<0.05; +56.8%) in static balance with significant differences between TRT and CG. PT showed significant improvements in all variables except static balance, with significant differences between MT and CG in muscle strength (PT: +29.20%; MT: +21.14%; CG: -2.69%), being the group with greatest improvements in 3 of 5 variables (agility: -14.26%; gait speed: -13.83%; muscle strength: +29.20%). PT, MT, and TRT showed significant improvements over time and between CG in agility, gait speed and aerobic capacity. No significant changes were observed for the CG.

**CONCLUSIONS:** The three interventions are effective in improving physical function in OW, although the PT program induces greater adaptations in lower limb muscle strength, gait speed, and agility, while MT had a larger influence on balance. The use of elastic bands with loops (CLX bands) can facilitate the application of these types of programs.

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There is a growing literature that takes into account the co-dependence of time-use domains. Less is known about the combined effect of time spent in sedentary behavior (SB) and accumulating physical activity (PA) at different intensity and bout length.

**PURPOSE:** To investigate a cross-sectional association of objectively-determined activities and cognitive function in community-dwelling older adults.

**METHODS:** A random sample of older adults (n=512, 47% male, aged 65-84 years) from NEIGE study in Tokamachi city, Niigata, Japan wore a tri-axial accelerometer (HUA-756C, Omron) for seven consecutive days and responded to a questionnaire in the fall of 2017. We assessed SB, light-intensity PA (LPA), short-bout (<10min) moderate-to-vigorous PA (MVPA), and long-bout (>10min) MVPA. Cognitive function was assessed by interviewers using the Mini-Mental State Examination, regarding a score of ≤26 as declined cognitive function. Data were analyzed using the compositional regression approach using isometric log-ratio transformations of the time-use composition, adjusting for age, sex, residential area, living arrangement, working with income, educational attainment, BMI, perceived health, and number of disease.

**RESULTS:** One third of older adults had declined cognitive function. SB, LPA, short-bout MVPA, and long-bout MVPA accounted for 50.2%, 43.8%, 3.4% and 2.6% of accelerometer wear time, respectively. A significant beneficial association was observed between larger proportion of long-bout MVPA relative to other activities and cognitive function. SB, LPA, and short-bout MVPA were not associated.

**CONCLUSIONS:** Promoting long-bout MVPA may be important for cognitive health among older adults.

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This study examined changes in anthropometric and cardiorespiratory fitness (CRF) characteristics of 26,325 Grade 6 (G6) schoolboys (11.0 -12.9y) living in the State of Qatar between 2003-2016.

**METHODS:** Anthropometric measures included standing height (cm), body mass (kg) and body mass index (BMI, kg/m2). A multistage shuttle run test (MSRT, laps) was used to assesses CRF. Comparisons between Qatari and non-Qatari boys were also conducted.

**RESULTS:** The results showed a trend for decreasing CRF (less MSRT laps) and increasing fatness (higher BMI) across the study period, irrespective of nationality. Qatari students generally performed worse on the MSRT test and were fatter than their non-Qatari peers. Also, the Qatari students displayed bigger decreases in MSRT (10 vs 4 laps) and their body mass (2.5 vs 0.7 kg) and BMI (1.3 vs 0.6 kg/m²) increased more over the study period than their non-Qatari peers. Furthermore, the percentage of G6 schoolboys classified as overweight or obese increased over the study period for all nationalities, with Qatari boys showing a greater prevalence of overweight or obesity than their non-Qatari peers. For example, the percentage of Qatari boys classified as overweight or obese by Centers for Disease Control and Prevention (CDC) standards increased from an average of 40.1% between 2003-2006 to 49.3% between 2013-2016 while the average for non-Qatari boys increased from 32.6% to 39.9% for the same periods.

**CONCLUSIONS:** These data support the need to establish a mechanism for the prevention and treatment of obesity and the development of physical activity strategies in the State of Qatar.

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**PURPOSE:** Physical activity (PA) is a potential modifiable correlate of the age-related decline in sexual function, but no studies have explicitly tested associations between PA and sexual activity. This study aimed to examine associations between PA, sedentary behaviour and sexual activity, problems and concerns in older adults.

**METHODS:** A cross-sectional observational population study. Data were from the English Longitudinal Study of Ageing, a nationally representative sample of older men and women living in England. A total of 7,038 older men and women aged ≥50 years were included. PA and TV viewing time were self-reported. Sexual behaviour and concerns were assessed by validated self-
CONCLUSIONS: Encouraging older adults to be more physically active could help to improve social relationships and, as a result, mental health and wellbeing.

THE METHODS: AR was calculated as the percentage of the energetic cost of slow walking relative to peak walking energy expenditure in 20 participants of the Longitudinal Aging Study at Towson (65% women, age 70±8 yrs). Slow walking energy expenditure was assessed as the average rate of oxygen consumption during the final 2 minutes of a 5 minute standardized treadmill walking test at 1.5 mph (0.67m/s) using indirect calorimetry. Peak walking energy expenditure was assessed as the average steady-state rate of oxygen consumption during 400 meters of fast-paced walking over a 20-meter course using a portable indirect calorimeter. Physical function (PF) was assessed using components of the expanded Short Physical Performance Battery (ExSPPB) test consisting of times to complete 5 repeated chair stands, standing balance, and two measures of gait speed over 6 meters (normal walk and narrow walk). The association between AR and functional performance was modeled using linear regression models, adjusted for age and body mass index.

RESULTS: In fully adjusted models, PF was negatively associated with AR (β = -0.014, p = 0.002), indicating that PF score improved 0.014 for each one-percentage higher AR. In further analyses of the individual components of PF, time to complete 5 chair stands (β = -0.006 chair stands per second, p = 0.02) and normal gait speed (β = -0.009 m/s, p < 0.005) were found to be negatively associated with AR, but there was no association with standing balance.

CONCLUSION: Greater aerobic reserve was associated with higher physical function, specifically chair stand time and normal gait speed. These results suggest that maintaining AR is critical to preserving lower extremity strength and speed with aging. Interventions to improve mobility in older adults should aim to both increase peak capacity and reduce energetic costs to optimize potential benefits.

While age-related elevations in systemic inflammation may contribute to the accelerated loss of skeletal muscle mass, previous findings have been limited by the number of biomarkers. Moreover, whether links between inflammation and muscle mass are independent of protein intake and habitual physical activity (PA) remain unknown.

THE PURPOSE: The aim of the study was to explore links between skeletal muscle mass and inflammatory biomarkers in older women with different metabolic risk status, while accounting for adherence to guidelines on protein intake and PA.

THE METHODS: Skeletal muscle mass index (SMI) was assessed in 112 women (67±1.5 years) by bioelectrical impedance together with the equation of Janssen et al. (2002) to obtain muscle mass expressed in relation to body weight. Fasting blood samples were obtained following standardized protocols. Acute-phase proteins C-reactive protein (CRP) and fibrinogen were determined, together with the following inflammatory biomarkers: Adiponectin, Oncostatin-M (OSM), Leukemia inhibitory factor-receptor (LIF-R), Interleukin-6 (IL-6), IL-8, IL-12, and IL-18. Protein intake and PA were determined during 6 days by food record and accelerometer, respectively. Classification of metabolic risk status was based on the metabolic syndrome.

Multivariate regression models were used to explore links between SMI and inflammatory biomarkers while adjusting for adherence to PA and protein intake guidelines and metabolic risk status.

THE RESULTS: Variations in SMI were inversely linked to levels of CRP (β-coefficient: -0.47; p < 0.05) and OSM (-0.20 p < 0.05), where the OSM link was attenuated after further adjustment for PA. In contrast, positive links between SMI and adiponectin (0.19 p < 0.05) and LIF (R 0.24 p < 0.05) were observed, which both remained significant in fully adjusted models. Links to other biomarkers were non-significant.

THE CONCLUSIONS: Several inflammatory markers are linked to skeletal muscle mass in older adults, where detrimental or beneficial actions are indicated depending on the biomarker. While adherence to PA guidelines moderates some of these links, others seem unaffected by either PA and protein intake or metabolic risk status. Further research is needed to elucidate mechanisms underlying these observations.