2020

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(No relationships reported)

Falls are commonly linked to gait and balance inconsistencies, influenced by a combination of variables including muscle strength and power. For years, short-term higher intensity multi-component dynamic training methods have been used to improve athletic performance in younger populations by significantly affecting variables including muscular strength and force, gait, and balance. Currently, there are a number of fall prevention programs. However, questions specifically surrounding mode and duration of these fall prevention programs still exist.
PURPOSE: To determine if a short-term, 8-week multi-component dynamic resistance-training program is effective in eliciting positive changes in factors that directly influence fall risk in older adults.
METHODS: Forty men and women (ages 55-90 yrs.; mean = 69.5) performed 8-weeks of multi-component dynamic training (3x/week; 45-minutes per session) consisting of skill appropriate agility and change of direction training, specific lower body strength exercises, and both stationary and dynamic balance training. Muscle performance was measured pre/post using a 10RM bilateral leg extension and a standardized sit-to-stand test. Repetition-by-repetition force (N) was assessed using a calibrated force plate during the sit-to-stand test. Balance, gait, and speed were measured via standardized balance and walking tests. Changes in lean and fat masses were obtained via dual energy X-ray absorptiometry (DXA). Pre/post mean differences were analyzed using Paired T-tests.
RESULTS: Training elicited positive outcomes in all muscle performance variables. Sit-to-stand efficiency increased (+53.9%; $p<0.001$) and repetition-by-repetition mean force improved +6.0% ($p<0.05$) during the same test. Significant increases in mean 10RM bilateral leg extension (+8.6kg; +28.0%; $p<0.001$), and positive balance changes were also observed (11.5%; $p<0.01$). Walking time decreased in all participants (-30.1%; $p<0.001$).
CONCLUSION: Shorter, higher intensity dynamic exercise can be a safe and effective way to improve muscle performance, gait speed, and balance in older adults at risk for falling.

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Associations Between Muscular Strength And Digestive System Disorders In Older Adults

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PURPOSE: To examine the associations of handgrip strength (HGS) with prevalence of digestive system disorders (DSD) in older adults.
METHODS: This cross-sectional study included 511 older adults (57% women; mean age 72 years old) who were without heart attack, stroke, or cancer in the past 5 years. HGS was calculated as the sum of the maximal contractions from both hands. Participants were categorized into sex-specific tertiles (thirds) of HGS. DSD cases were identified via self-administered medical history questionnaire. The DSD were further categorized into disorders of the upper tracts (gastroesophageal reflux disease, ulcers), intestines (irritable bowel syndrome, inflammatory bowel disease, diverticulitis), or accessory organs (gallbladder, liver, pancreas). Logistic regression was used to calculate the odds ratios (ORs) and 95% confidence intervals (CI) of DSD among HGS thirds while adjusting for sex, age, smoking, heavy alcohol consumption, diet quality, cardiorespiratory fitness, and body mass index (BMI).
RESULTS: There were 192 DSD cases. Compared with the lower third of HGS (least strong), the ORs (95% CIs) of having DSD were 0.58 (0.37-0.92) and 0.50 (0.31-0.81) among those in the middle and upper (strongest) thirds, respectively, after adjusting for the possible confounders. Similar trends were observed in the DSD of the upper tracts, intestines, and accessory organs. In a joint analysis of HGS and BMI (another strong risk factor of DSD), participants were dichotomized into weak (lower third) or strong (middle and upper thirds) and normal weight (<25.0 kg/m2), overweight (25.0-29.9 kg/m2), or obese (≥30.0 kg/m2) based on BMI. Compared with the weak-obese group, ORs (95% CIs) were 0.60 (0.28-1.27), 0.27 (0.11-0.65), 0.43 (0.21-0.88), 0.41 (0.20-0.83) and 0.13 (0.06-0.30) for the weak-overweight, weak-normal weight, strong-obese, strong-overweight, and strong-normal, respectively, after adjusting for the possible confounders.
CONCLUSIONS: HGS was inversely associated with DSD in older adults. In addition, higher HGS appears to attenuate the increased prevalence of DSD in overweight and obese participants. Prospective studies are warranted.

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Effects Of Undulating Vs. Linear Periodization On Body Composition In Untrained Older Adults

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The effects of undulating periodization (UP) on body composition and strength during a resistance training (RT) program have been investigated in both sedentary and trained individuals; however, research on the topic is limited in an elderly population.
PURPOSE: The aim of this study was to evaluate the effect of an UP-RT program on body composition in older adults.
METHODS: Seventeen (n=9, men; n=8, women) untrained elderly individuals (64.2±2.0 years, 72.2±10.8 kg; 164.8±7.6 cm; 25.6±2.6 kg·m^{-2}) with no previous RT experience were randomly assigned to either a linear training (n=8, LT) or UP (n=9) program. After 3 weeks of familiarization, all participants performed three weekly RT bouts over an 8-week study period. Body composition was assessed via dual energy X-ray absorptiometry. Statistical comparison (pre-test vs post-test) was performed with the paired t test or Wilcoxon (depending on the normality of the data), and a repeated measures ANOVA was employed to determine interactions(*Time*=pre-test vs test; *Group*=LT vs UP and *Time x Group*). Effect size (ES) was calculated with Hedges g; the normality and homogeneity of the data were checked with the Shapiro-Wilk and Levene tests, respectively.
RESULTS: The results are reported in the order of LT and UP, respectively. No significant changes were found for the study variables: BM (Δ= -0.3±1.0 kg; P=0.374; ES=-0.05 and Δ= 0.6±1.0 kg; P=0.101; ES=0.06), FM (Δ= -0.6±1.3 kg ; P=0.212; ES=-0.24 and Δ= -0.7±2.3 kg; P=0.389; ES=-0.17) and FFM (Δ= 0.3±1.8 kg; P=0.679; ES=0.04 and Δ= 1.3±2.4 kg; P=0.145; ES=0.17). No statistical differences were found between training protocols.
CONCLUSIONS: Although body composition variables did not change significantly over the study period, the slight improvements observed conceivably can contribute to the health of these older adults; this hypothesis is corroborated by parallel studies that we have carried out in this population. Given previous data showing exercise-induced FFM gains in the elderly, it can be speculated that lack of significant findings may be the result of suboptimal caloric and/or protein consumption.