

Once-Weekly Single-Set Resistance Training Improves Body Composition and Muscular Strength in Older Adults

TYLER M. WEISS & MALCOLM T. WHITEHEAD

Human Performance Lab; Kinesiology & Health Science; Stephen F. Austin State University; Nacogdoches, TX

Category: Masters

Advisor / Mentor: Whitehead, Malcolm T. (whitehead@sfasu.edu)

ABSTRACT

The loss of muscle mass associated with aging, known as sarcopenia, is a public health issue among the older population. Physical activity, in particular resistance training, has been shown to be an effective treatment in countering age-related muscle loss. Time is a primary barrier for adhering to an exercise program, and a time-efficient training modality may be useful for older individuals who perceive time as a barrier to exercise. The Exercise is Medicine Initiative encourages physicians and other health care providers to include physical activity when designing treatment plans. **PURPOSE:** The purpose of the investigation was to determine whether once-weekly single-set resistance training improves body composition and muscular strength in older adults. **METHODS:** Fifteen individuals (5 males and 10 females) aged 65 ± 6.84 years participated in a Pre/Post within subjects testing research design. Prior to training each participant had their body composition measured with a DEXA, 1-repetition maximal lift (lat pull-down, seated row, chest press, shoulder press, leg press, leg extension, and leg curl), grip strength, chair to stand, and arm curl tested. Training protocol consisted of one resistance training session every week for six weeks in which each participant performed a single set to muscular failure on seven resistance exercise machines. After the six-week training period participants underwent the same testing protocol. Paired Samples T-Tests were used for statistical comparisons with $p \leq 0.05$ used for significance. **RESULTS:** Body fat was reduced following the training (Pre $39.78 \pm 8.51\%$, Post $39.07 \pm 8.37\%$, $p = 0.019$) whereas lean body mass was increased (Pre 94.60 ± 30.37 lb, Post 96.53 ± 30.64 lb, $p < 0.001$). All 1-RMs increased following training: lat pull-down (Pre 96.53 ± 42.91 lb, Post 119.67 ± 47.07 lb, $p < 0.001$), seated row (Pre 85.33 ± 33.04 lb, Post 98.67 ± 37.30 lb, $p < 0.001$), chest press (Pre 74.60 ± 43.01 lb, Post 90.00 ± 52.07 lb, $p = 0.002$), shoulder press (Pre 38.33 ± 27.78 lb, Post 45.33 ± 28.05 lb, $p < 0.024$), leg press (Pre 166.27 ± 40.57 lb, Post 242.07 ± 77.85 lb, $p < 0.001$), leg extension (Pre 107.67 ± 47.64 lb, Post 140.33 ± 59.30 lb, $p < 0.001$), leg curl (Pre 67.47 ± 25.60 lb, Post 81.67 ± 32.28 lb, $p = 0.003$), and grip strength also improved (Pre 30.78 ± 11.34 kg, Post 32.07 ± 11.90 kg, $p = 0.013$). **CONCLUSION:** Based on the data from this investigation engaging in a once-weekly single-set resistance training session results in improvement in lean body mass, body fat, and muscular strength. These results demonstrate that a minimal time commitment to exercise per week elicits improvement of strength characteristics in older adults. Implementation of the training strategy utilized in this study may translate to enhanced engagement in physical activity to help offset the deleterious effects of sarcopenia associated with aging.