

Effects of 12 weeks combined weight and chain versus combined weight and elastic band variable resistance training on upper and lower body muscular strength and endurance among untrained males in Iran

ABSTRACT

Several studies have shown a positive association between variable resistance training (VRT) and the improvement of muscular performance. However, the most effective method of VRT to improve muscular performance in untrained individuals remains unclear. The objective of this study was to examine the effects of two methods of VRT on maximal muscular strength and endurance among untrained male adults. Fifty apparently healthy untrained males (age: 21.5 ± 1.95 years) were selected randomly and assigned into three groups: combined weight and chain (WC), combined weight and elastic band (WE), and freeweight (CG). All three groups completed 12 weeks of high intensity resistance training (70-80% of one-repetition maximum) with three sets of 8-12 repetitions, two times per week. Approximately 65% of the whole resistance was provided by free-weights and the other 35% of the resistance was provided by chains and elastic bands for WC and WE groups, respectively. Dependent variables including maximal muscular strength and endurance using one-repetition maximum and maximum repetitions to muscular fatigue were measured, respectively, in the pre-test, post-test 1 (week 6) and post-test 2. The significance level was set at $P < 0.05$. No differences existed among all groups at baseline for dependent variables. A mixed model ANOVA with repeated measurements analysis revealed that all groups showed significant improvements in maximal muscular strength and endurance during and after the intervention ($P = 0.0001$). In WE and WC groups, maximal muscular strength and endurance were significantly greater than CG group during and after the intervention, and there were no significant differences between WE and WC groups in the maximal muscular strength and endurance during and after the intervention. However, the WE group showed an insignificant more improvement in maximal muscular strength and endurance compared with WC group after the intervention (chest press strength: 47.94 ± 4.2 vs. 46.76 ± 4.4 kg, squat strength: 85.29 ± 6.5 vs. 80.73 ± 6.4 kg, chest press endurance: 16.94 ± 1.24 vs. 15.47 ± 1.58 repetitions, and squat endurance: 17.94 ± 0.74 vs. 16.58 ± 1.66 repetitions). The results of this study show that VRT has a significant better effect than freeweight resistance training to improve upper and lower body muscular strength and endurance during and after 12 weeks intervention, in particular, WE training has a slightly better effect than WC training to improve upper and lower body muscular strength and endurance after 12 weeks of VRT among untrained male adults in Iran.

Keyword: Combined weight and chain; Combined weight and elastic band; Maximum repetitions; One-repetition maximum; Variable resistance training