

「校際傑出學術論文授權暨發表會」

論文摘要表

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| 論文名稱 | 不同肌力訓練介入模式對下肢運動能力表現之影響 |
| 英文論文名稱 | The Effect of Different Muscular Strength Training Intervention Modes on Lower Limb Performance. |
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| 學位類別 | 碩士 |
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| 中文關鍵詞 | 肌力、傳統式重量訓練、振動式訓練、組合式訓練 |
| 外文關鍵詞 | muscle strength, traditional weight training, vibration training, complex training |
| 中文摘要 | 肌力 (muscular strength) 是每位運動員必備的身體素質，也是一切運動表現之基礎。 研究目的 ：探討不同肌力訓練介入模式對下肢運動 |

能力表現之影響。**研究方法**：以 26 名 13~15 歲男青少年為受試對象(身高 165.7(6.7)公分；體重 58.5(10.3)公斤)，比較連續 6 週傳統式(50%~60%最大肌力×15 次×3 組，運動組間休息 1:1；控制組)、振動式(頻率 30Hz、振幅 4.00-6.00mm；50%~60%最大肌力×15 次×3 組，運動組間休息 1:1；振動組)及組合式(50%~60%最大肌力×5 次×3 組，運動組間休息 1:1，配合動作執行最低點，執行停留 5 秒鐘執行等長收縮；組合組)等三種不同肌力訓練模式，執行動作包含：蹲舉(蹲下膝關節至 90 度)、舉踵(至頂點)與向前突刺(前腿蹲下呈 90 度)等三種動作訓練，探討對於運動肌力、下肢動力及平衡控制等功能表現之影響。**研究結果**：與連續 6 週訓練之傳統組相比較：一、膝關節等速肌力：振動組 180°/s 等速肌力表現其疲乏指數(伸張 5.1%；屈曲 5.4%)、在 30 度的力矩值(伸張 1.5%；屈曲 31.4%)均顯著提升；組合組伸張與屈曲在相對作功量(伸張 2.4%；屈曲 2.4%)、總作功量(伸張 8.2%；屈曲-0.1%)及 60/s 等速肌力之達最大力矩時間(伸張-0.4%；屈曲-5.4%)、總作功量(伸張 15.9%；屈曲 20.7%)均呈顯著提升。二、下肢肌動力：組合組下蹲跳高度(10.2%)及快速爆發力(1.6%)均顯著提升。三、平衡控制：振動組雙腳整體穩定度(52%)與左腳穩定度(5.7%)；組合組雙腳整體穩定度(54.4%)、右腳左右不穩定度(44.9%)、右腳整體穩定度(4.2%)及左腳穩定度(9.0%)均顯著提升。**研究結論**：一、傳統式重量訓練、振動式訓練以及組合式訓練等三種不同肌力訓練介入模式，有助提升下肢運動能力表現；二、組合式訓練比傳統式與振動式重量訓練操作，更能有效提升下肢膝關節運動控制能力表現。

關鍵詞：肌力、傳統式重量訓練、振動式訓練、組合式訓練

英文摘要

Muscular strength is the foundation of all sports performance. **Objective:** To investigate the effects of different strength training modes of lower limbs performance. **Methods:** 26 male adolescents (13 to 15 years old;

height 165.7 (6.7) cm; weight 58.5 (10.3) kg) completed a 6 weeks different modes weight training. (1.Traditional weight training: 50% ~ 60% of one maximal repetition \times 15 times \times 3 sets \times exercise : rest= 1:1; T; 2.Vibration training: frequency 30Hz \times amplitude of 4.00-6.00mm \times 50% ~ 60% one maximal repetition \times 15 times \times 3 sets \times exercise : rest=1: 1; V; 3.Complex training: 50% ~ 60% of one maximal strength with 5 seconds isometric contraction at the lowest position \times 5 times \times 3 sets, exercise : rest =1:1; C). There were three different strength training actions including squat (squat knee to 90 degrees), calf raise (to peak) and front lunge (front leg squat at 90 degrees). We recorded isokinetic strength, lower extremity functional performance and balance control. **Results:** (1)There were significantly increased in work fatigue (extension (E), 5.1%; flexion (F), 5.4%) and torque at 30 degrees (E,1.5%; F, 31.4%; V vs. T),work relative (E, 2.4%; F, 2.4%; C vs. T) and total work (E, 8.2%; F, -0.1%; C vs. T) in 180 °/s isokinetic testing. The performances of time to peak torque (E, -0.4%; F, -5.4%; C vs. T) and relative work (E, 15.9%; F, 20.7%; C vs. T) improved in 60 °/s isokinetic testing. (2) The performances of countermovement jump of height (10.2%) and fast twitch fibres firing (1.6%) increased significantly in C. (3) Limits of stability: V increased in both overall stability index (OSI) (52%) and left stance stability (LSS) (5.7%). C increased in both OSI (54.4%), right stance stability (44.9%), single right ROS (4.2%) and LSS (9.0%). **Conclusions:** The effects of different muscular strength training intervention modes have benefits for lower limb performance, and complex training is the most effective .

Key words: muscular strength, traditional weight training, vibration training, complex training