

ABSTRACT :

The purpose of this study was to investigate the effects of 8-week whole-body vibration (BodyGreen WBV) training on running economy (RE) and power performance. Twenty-four male collegiate athletes were recruited and randomly assigned to experimental (WBV) and placebo (PL) groups. The WBV subjects performed semi-squat vibration training (30 Hz, ± 1 –2 mm, 3 times per week), while PL subjects performed identical training without vibration. The isometric maximum voluntary contraction tests were used to evaluate maximal isometric force (F_{max}) and rate of force development (RFD) of lower extremities, before and after the intervention, and RE was measured on a level treadmill at 3 velocities (2.68, 3.13, and 3.58 m·s⁻¹). The F_{max} of the lower leg (plantar flexion, from 80.8 \pm 24.5 to 99.0 \pm 33.9 N·m, $p < 0.05$, $\eta^2 = 0.567$; dorsiflexion, from 38.1 \pm 6.5 to 43.0 \pm 7.7 N·m, $p < 0.05$), and the RFD of 0-200 ms during plantar flexion (from 186.0 \pm 69.2 to 264.6 \pm 87.2 N·m·s⁻¹, $p < 0.05$, $\eta^2 = 0.184$) were significantly increased in the WBV group after training. The averaged RE values for the 3 running velocities were significantly improved after WBV training (pre- vs. post-training, 4.31 \pm 0.33 vs. 4.65 \pm 0.34 m·ml⁻¹·kg⁻¹, $p = 0.001$, $\eta^2 = 0.654$); however, nonsignificant differences were found in the PL group (pre- vs. post-training, 4.18 \pm 0.26 vs. 4.26 \pm 0.44 m·ml⁻¹·kg⁻¹, $p = 0.476$). The WBV training significantly improved RE at selected speeds (~ 5.0 – 8.5 %, $p < 0.05$). These results indicated that short-term WBV training could be an effective stimulus to enhance RE and lower extremity power performance in competitive Effect of Whole-body Vibration on Running Economy 3 athletes.

Key Words: muscular strength; muscular power; oxygen consumption