

Effects of Whole Body Vibration on Movement Variability Performing a Resistance Exercise with Different Ballasts and Rhythms

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Abstract : Some researchers stated that whole body vibration (WBV) generates postural destabilization, although there is no extensive research. Therefore, the aim of this study was to analyze movement variability when performing a half-squat with a different type of ballasts and rhythms with (V) and without (NV) WBV in male athletes using entropy. Twelve experienced in strength training males (age: 21.24 \pm 2.35 years, height: 176.83 \pm 5.80 cm, body mass: 70.63 \pm 8.58 kg) performed a half-squat with weighted vest (WV), dumbbells (D), and a bar with the weights suspended with elastic bands (B), in V and NV at 40 bpm and 60 bpm. Subjects performed one set of twelve repetitions of each situation, composed by the combination of the three factors. The movement variability was analyzed by calculating the Sample Entropy (SampEn) of the total acceleration signal recorded at the waist. In V, significant differences were found between D and WV ($p < 0.001$; ES: 2.87 at 40 bpm; $p < 0.001$; ES: 3.17 at 60 bpm) and between the B and WV at both rhythms ($p < 0.001$; ES: 3.12 at 40 bpm; $p < 0.001$; ES: 2.93 at 60 bpm) and a higher SampEn was obtained at 40 bpm with all ballasts ($p < 0.001$; ES of WV: 1.22; ES of D: 4.49; ES of B: 4.03). No significant differences were found in NV. WBV is a disturbing and destabilizing stimulus. Strength and conditioning coaches should choose the combination of ballast and rhythm of execution according to the level and objectives of each athlete.

Keywords : accelerometry, destabilization, entropy, movement variability, resistance training

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