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### Does whole body vibration training affect knee kinematics and neuromuscular control in healthy people?

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### Does whole body vibration training affect knee kinematics and neuromuscular control in healthy people?

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#### Abstract

This study aimed to investigate the effect of whole body vibration (WBV) training on the knee kinematics and neuromuscular control after single-legged drop landings. Surface electromyographic (EMG) activity of the rectus femoris and hamstring muscles and knee and ankle accelerometry signals were acquired from 42 healthy volunteers. Participants performed three pre-test landings and after a recovery period of three minutes, they completed one set of six bouts of WBV each of one minute duration (30 Hz – 4 mm), followed by a single-leg drop landing. After the WBV intervention no significant changes were observed in the kinematic outcomes measured, although the time to stabilise the lower-limb was significantly lower after the vibration training ( $F(8,41) = 6.55$ ;  $P < 0.01$ ). EMG analysis showed no significant differences in the amplitude of rectus femoris or hamstring muscles after WBV training, however, significant differences in EMG frequency of the rectus femoris were found before ( $F(8,41) = 7.595$ ;  $P < 0.01$ ) and after toe-down ( $F(8,41) = 4.440$ ;  $P < 0.001$ ). Finally, no significant changes were observed in knee or ankle acceleration after WBV. Results suggest that WBV can help to acutely enhance knee neuromuscular control, which may have clinical significance and help in the design of rehabilitation programmes.

**Keywords:** *knee, proprioception, drop landings, injury prevention, electromyography, vibration training*