

Evaluation of whole-body vibration exercise on neuromuscular activation through electromyographic pattern of vastus lateralis muscle and on range of motion of knees in metabolic syndrome: a quasi-randomized cross-over controlled trial.

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Metabolic syndrome (MetS) is related to overweight and obesity, and contributes to clinical limitations. Exercise is used for the management of MetS individuals, who are often not motivated to perform this practice. Whole body vibration exercise (WBVE) produces several biological effects, besides being safe, effective, and feasible for MetS individuals. This pseudo-randomized and cross-over controlled trial study aimed to analyze the effects of WBVE on MetS individuals' neuromuscular activation using the surface electromyography (sEMG) pattern (root mean square (RMS)) of the vastus lateralis (VL) muscle and on the range of motion (ROM) of the knees. Participants (n = 39) were allocated to two groups: the treatment group (TG), which was exposed to WBVE, and the control group (CG). WBVE interventions were performed twice a week, for a period of 5 weeks. ROM and sEMG were analyzed at baseline, after the first session, and before and after the last session. sEMG (%RMS) significantly increased in the acute effect of the last session of WBVE (108.00 ± 5.07 , $p < 0.008$, right leg; 106.20 ± 3.53 , $p < 0.02$, left leg) compared to the CG. ROM did not significantly change in TG or CG. In conclusion, 5 weeks of WBVE exerted neuromuscular effects capable of increasing VL muscle RMS in individuals with MetS, this effect being potentially useful in the physical rehabilitation of these individuals.

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