D. Sá-Caputo, L. Liane Paineiras-Domingos, A. Francisca-Santos, E. M. dos Anjos, A. Silva Reis, M. Fritsch Toros Neves, W. Oigman, R. Oliveira, A. Brandão, C. Bittencourt Machado, X. Chiementin, R. Taiar, A. Sartorio, M. Bernardo-Filho.

Whole-body vibration improves the functional parameters of individuals with metabolic syndrome: an exploratory study

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Background: Metabolic syndrome (MetS) is a cluster of metabolic abnormalities that increases the cardiovascular risk. Regular physical exercise can promote benefits, but the MetS individuals are demotivated to perform it. Thus, new possibilities are important as an alternative intervention. The whole-body vibration can be considered an exercise modality and would be a safe and low-cost strategy to improve functional parameters of individuals in different clinical conditions. The aim of this exploratory study was to assess effects of whole-body vibration on functional parameters of MetS individuals. The hypothesis of this work was that the whole-body vibration could improve the functionality of MetS individuals.

Methods: Twenty-two individuals performed the intervention. The vibration frequency varied from 5 to 14 Hz and the peak-to-peak displacements, from 2.5 to 7.5 mm. Each session consisted of one minute-bout of working time followed by a one minute-bout of passive rest in each peak-to-peak displacement for three-times. The whole-body vibration protocol was applied twice per week for 5 weeks. Data from the trunk flexion, gait speed, sit-to-stand test and handgrip strength were collected. Physiological parameters (blood pressure and heart rate) were also evaluated. The Wilcoxon Rank test and Student t-test were used.

Results: No significant changes ($p > 0.05$) were observed in physiological parameters (arterial blood pressure and heart rate). Significant improvements were found in trunk flexion ($p = 0.01$), gait speed ($p = 0.02$), sit-to-stand test ($p = 0.005$) and handgrip strength ($p = 0.04$) after the whole-body vibration.

Conclusions: In conclusion, whole-body vibration may induce biological responses that improve functional parameters in participants with MetS without interfering in physiological parameters, comparing before and after a 5-week whole-body vibration protocol.