

## **Immediate effect of whole-body vibration exercise performed in vertical versus side-alternating displacement modes on physiological parameters, perception of effort, strength and functionality in adults with obesity.**

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Background: obesity, defined as an abnormal accumulation of body fat, is becoming a global epidemic. Individuals with obesity may present with increased abdominal fat, which is associated with hypertension, altered respiratory mechanics, higher resting heart rate, and may contribute to an increased cardiovascular risk. Physiological parameters, such as heart rate, blood pressure, respiratory rate, and oxygen saturation, can change hours before the occurrence of a clinically relevant adverse event. Thus, physiological parameters can be considered good predictors of clinical deterioration. Obesity is also associated with physical dysfunctions that can impair physical performance. The non-pharmacological therapeutic strategy for the treatment of obesity involves lifestyle modifications, including a healthy diet and regular physical exercise. Whole-body vibration (WBV) exercise, a type of physical activity, has demonstrated benefits in several specific populations, including obese individuals. Objectives: The objective of this study was to evaluate the immediate effects of a single whole-body vibration (WBV) exercise session, consisting of 15 sets, using a vibration platform (VP) with alternating vertical or lateral displacement, on physiological parameters, perceived exertion, strength, and functionality in obese adults.

Methods: seventy-two obese adult participants were randomly divided into three groups (vertical group, alternating lateral group, and placebo group). Physiological parameters were assessed before, during, and after the intervention, in addition to perceived exertion, functionality, and muscle strength.

Results: when comparing the results before and after the intervention, the heart rate–pressure product increased significantly in the alternating lateral group ( $p = 0.005$ ), and heart rate increased significantly ( $p = 0.0001$ ) and then decreased significantly ( $p = 0.030$ ) only in the alternating lateral group. Post hoc analysis revealed a significant increase in perceived exertion in the lateral alternation group, from the period before the intervention to the 10th set ( $p = 0.006$ ) and from the period before to the period after the intervention ( $p = 0.011$ ). In the vertical group, a significant increase was observed from the period before the intervention to the 10th set ( $p = 0.020$ ).

Conclusions: in conclusion, considering all the findings of this study, whole-body vibration (WBV) exercise promoted some immediate changes in physiological parameters and perception of effort in obese adults. WBV exercise with the alternating vibration platform induced significant fluctuations in heart rate and increased the heart rate–blood pressure product, although with values within the normal range. Perception of effort increased in all groups. Considering the absence of discrepant changes in physiological parameters, impact on the cardiovascular system, and fatigue, the WBV exercise intervention in side-

alternating or vertical vibration vibratory platforms can be considered a viable non-conventional exercise option for the obese population.

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