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ACUTE RESPONSES OF TWO HIIT PROTOCOLS IN INHIBITORY CONTROL IN CHILDREN AND ITS RELATIONSHIP WITH HAND GRIP STRENGTH

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Background: Physical fitness can interfere with the inhibitory control of children, one of which is static muscle strength (SMF). However, the findings in the literature are insufficient to relate handgrip strength and inhibitory control. Physical exercise has been identified as a strategy for improving cognitive function and some evidence indicates that an acute session of high-intensity interval training (HIIT) causes improvements in executive functions. Furthermore, it is necessary to clarify the dose-response effect of exercise on executive functions in children with different levels of physical fitness.

Objectives: To investigate the acute implications of two HIIT protocols on inhibitory control in schoolchildren.

Methods: The research was carried out in a public school in Belém-PA with 4th grade students and had a sample of 21 children aged 9 to 10 years, with the intention of defining the strength levels, the dynamometry test was applied for stratification of the sample into two groups (more force and less force). In this crossover randomized clinical trial, participants performed two HIIT protocols (Progressive and Tabata) on two days separated by an interval of 72 hours. HIIT Tabata lasted 4 minutes with 8 sets of 20 seconds of maximum effort and 10 seconds of rest. The progressive HIIT lasted 5 minutes, with 5 series of 20 seconds of maximum effort followed by 30, 40, 50, 60 and 20 seconds of passive rest respectively, the exercises used body weight. The inhibitory control was evaluated by the Flanker test and the congruent and incongruent response times were analyzed. The test was performed at rest and repeated 11 minutes after performing the exercises. Results were analyzed by estimation statistics and results expressed as significance (p), range (95%) and effect size (g).

Results: after performing progressive HIIT, a reduction in the reaction time of the incongruent condition of children with less strength was observed (g = -0.277); (p= 0.0224; 95.0% CI -0.537, -0.0774), different for the group with more strength that did not show improvement in the same condition (g=0.0421; p= 0.9; 95.0%CI -0.394, 0.662). No differences were found in congruent reaction time.

Conclusion: We conclude that an acute session of high-intensity exercise with progressive rest can positively affect the incongruent reaction time in inhibitory control tests of children with less strength. However, in this study, children with more strength did not have the same benefit in both models of high-intensity exercise.

Implications: This research shows that progressive HIIT can be used as an alternative strategy to benefit children with lower SMF in their inhibitory control and academic performance due to its accessibility and low investment.

Keywords: Executive Function, Basic education, High Intensity training

Conflict of interest: The authors declare no conflict of interest.

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CUTOFF POINT FOR TOTAL FAT MASS TO IDENTIFY OF OBESITY IN COMMUNITY-DWELLING OLDER WOMEN: A CROSS-SECTIONAL STUDY

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Background: Obesity is a public health problem defined as an excess accumulation of body fat. The obesity has an increasing prevalence, affecting more than 650 million adults worldwide. The World Health Organization recommends assessing obesity using a body mass index (BMI) $\geq$ 30 kg/m2 as the cutoff point for obese individuals. However, the BMI classification has its limitations because it is not able to discriminate fat mass from lean mass. In addition, with aging, changes in body composition occur, such as a reduction in lean mass and an increase in body fat, without changes occurring in BMI.

Objective: To establish a cutoff point for total fat mass to identify obesity in community-dwelling Brazilian elderly women.

Methods: This was a cross-sectional study involving elderly women evaluated at the Laboratório de Fisiologia do Exercício at the Universidade Federal dos Vales do Jequitinhonha e Mucuri from June 2016 to June 2017. Participants were submitted to anthropometric (weight, height, and BMI) and body composition (total fat mass) assessments measured using dual-energy X-ray abdominmetry (DXA Lunar Type DPX, 2005 software). The sample was categorized by nutritional status based on the obtained BMI. Data were analyzed using the receiver operating characteristics curves and the Youden Index determined the cut-off point. Statistical significance was set at 5%.

Results: One hundred and sixty-one elderly women aged between 65 and 96 years (74.32±7.16) participated in the study. According to BMI, 47.8% of the sample was categorized as obese (BMI $\geq$ 30 kg/m2). The area under the curve value was satisfactory (AUC: 0.94) and the ROC curve calculated. The cut-off point for the prediction and determination of obesity in community-dwelling elderly Brazilian women was 25.4 kg of total fat mass (Sensitivity: 0.81; Specificity: 0.94). In addition, the cutoff point presented satisfactory positive and negative predictive values (93.94% and 84.21%, respectively), demonstrating good accuracy in identifying obesity.

Conclusion: Obesity is a chronic condition commonly associated with other comorbidities throughout life. Therefore, its early identification is crucial for monitoring and interventions in the context of obesity. Considering the variety of body composition assessment instruments, it is clinically important to propose an alternative for the diagnosis and a cutoff point for the total fat mass that is capable of identifying the obese individual, using DEXA, which is known to present a high accuracy of body composition measurement.

Implications: The findings of this study may support future studies that investigate obesity or sarcopenic obesity using a gold standard instrument for assessing body composition.

Keywords: Obesity, Fat mass, Body composition

Conflict of interest: The authors declare no conflict of interest.

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