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Importance of intensity and exercise modality

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Investigation of a 12-weeks community-based training intervention in children with obesity: Importance of intensity and exercise modality.

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Purpose Childhood obesity is a major public health concern. Physical activity as part of a multidisciplinary lifestyle intervention is a keystone in treating obesity. High-intensity interval-training (HIIT) has shown several physiological benefits, including weight reduction and cardiovascular health. Few studies have monitored the intensity during HIIT or compared different types of exercises. This study is part of a randomized controlled project investigating the effect of HIIT in a group of children with obesity, and focuses on the training intensity of different activities in a community-based training setting.

Methods Sixty-three children with obesity were enrolled in a 12-weeks training intervention, with three weekly sessions. Each session included 4x4 minutes of HIIT focusing on one of three specific exercise modalities; Ball games, CrossFit, or running. Heart rate (HR) was measured to quantify time spent in high (>85% of max HR) intensity activity. In nine of the HIIT sessions, enjoyment (Physical Activity Enjoyment Scale) and perceived exertion (Borg CR-10 scale) were recorded. A three-way (sex, modality, intensity) mixed ANOVA was used to compare the HR data. Friedman and Wilcoxon Signed-rank tests (post hoc) were used to compare enjoyment and perceived exertion between types of activity.

Results The participants' median age was 12.3 years, with a body-mass index of 28.84 ± 4.04 . Ball games elicited less time in the high-intensity zone (4.96 ± 5.75 minutes) than CrossFit (7.73 ± 7.25 minutes, $P = 0.010$) and running (6.36 ± 5.80 minutes, $P = 0.025$). No gender interaction was observed ($p=0.995$). The enjoyment of physical activity was rated high, on average 4.5 for all activities (scale from 1 (lowest) – 5 (highest)), but no significant difference was found. The perceived exertion was rated lower by adolescents compared to children in ball games (5.1 ± 1) compared to CrossFit (6 ± 1 , $P = 0.017$) and running (6 ± 1 , $P = 0.004$). Furthermore, with all participants combined, ball games were perceived as less exhausting than CrossFit ($P = 0.002$) and running ($P = 0.003$).

Conclusions The participants had high enjoyment ratings during all three modalities. CrossFit and running seem favorable to elicit more time in the high-intensity zone compared to ball games. This should be considered in future training interventions.