

# The effectiveness of a high-intensity interval games intervention in schoolchildren: A cluster-randomized trial

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## Abstract

The aim of this study was to assess the effectiveness of a high-intensity interval training (HIIT) intervention based on playground games (MOVI-daFit!) on improvements in adiposity, physical fitness, and cardiometabolic risk factors in schoolchildren. A cluster-randomized controlled trial (RCT) was performed that included 562 schoolchildren (9–11 years) from 10 schools in Cuenca, Spain. The intervention consisted of four 60-min sessions per week in the school setting. Analyses were conducted on the intention-to-treat basis. Changes in physical fitness parameters (cardiorespiratory fitness: main outcome), body composition, blood pressure, and biochemical cardiometabolic risk parameters were analyzed using both mixed linear and logistic regression models, controlling for baseline covariates, Tanner stages, health dietary score index, body mass index, and cluster factor school. In boys, no significant differences in any outcome measure were noted except for the standing long jump test (10.13 cm; 95% CI 2.94 to 17.32;  $p = 0.006$ ) between the intervention group (IG) and the control group (CG). Improvements in mean arterial pressure ( $-1.68$  mmHg; 95% CI  $-3.28$  to  $-0.08$ ;  $p = 0.039$ ), the triglyceride/HDL-c ratio ( $-0.36$  mg/dl; 95% CI  $-0.59$  to  $-0.13$ ;  $p = 0.002$ ), C-reactive protein ( $-0.23$  mg/L; 95% CI  $-0.43$  to  $-0.03$ ),  $VO_2$ max (1.44 ml/kg/min; 95% CI 0.52 to 2.36,  $p = 0.002$ ), 20-m shuttle run test (3.64 laps; 95% CI 0.51 to 6.78), and standing long jump test (7.04 cm; 95% CI 1.21 to 12.87;  $p = 0.018$ ) were observed in girls in the IG compared with those in the CG. Body composition parameters did not change significantly in either boys or girls. Additionally, children with lower fitness levels obtained greater improvements than children with higher fitness levels. In conclusion, MOVI-daFit! may represent a good strategy for incorporating HIIT into playground games, although its implementation may need to be improved to extend the benefits to children and enhance its adherence. © 2021 The Authors. Scandinavian Journal of Medicine & Science In Sports published by John Wiley & Sons Ltd.

**Author keywords**

children; effectiveness; HIIT; physical fitness