A Multicomponent Physical Activity Intervention Effect on Weekly Steps and Physical Fitness in Preadolescents: A Pre-test - Post-test Study and Randomised Control Trial

Introduction

Physical activity (PA) has well established physical, cognitive, and psychological benefits. Despite this fact, physical inactivity has reached pandemic proportions in recent years. Multicomponent PA interventions in youth are stressed as a viable approach to improve PA and physical fitness (PF). The aim of this study was to investigate the efficacy of a school-based PA intervention on PA and PF in preadolescents.

Methods

A total of 178 students (9.1±0.7 years) were randomly assigned to an experimental or control group. The multicomponent 16-week experimental programme included goal setting, wearable activity tracker feedback, physical exercising, and motivating students to be active. T-test for independent samples was employed for detecting pre- and post- differences in steps number in the experimental group and repeated measures ANOVA was used for detecting the potential difference in PF (standing broad jump, hand grip, shuttle run 20 m, body mass index, and waist circumference) between the control and experimental group.

Results

The results showed that participants from the experimental group increased their steps during weekdays, $t(83) = 8.66$, $p < 0.001$, and during the weekend, $t(83) = 5.56$, $p < 0.001$. There were no differences between the experimental and control group in the anthropometric and PF measures from pre-test to post-test (p-value ranged from 0.056 to 0.72).

Conclusion

Our study revealed the feasibility and efficacy of a multicomponent school-based PA intervention in increasing objectively measured PA during weekdays and at the weekend in preadolescents. Future studies should investigate the long-term effects and their impact on PF and future adolescents' health-related behaviours.

Keywords: physical activity, physical fitness, preadolescents, school intervention programme, wearable activity trackers.