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Background

School-based interventions show inconsistent results in reducing obesity-related problems. Most of intervention studies are targeting girls because they have shown lower rates of physical activity and higher prevalence of obesity.

The aim of this study was to compare the changes observed in BMI, percentage of Body Fat, percentage of Trunk Fat and Moderate to Vigorous physical activity (MVPA) levels between boys and girls engaged in a school-based intervention program.

Methods

The “ACORDA” Project, which stands for obese children and adolescent involved in PA and diet program (ACORDA *in* Portuguese) comprise 131 children and adolescents from 6 schools in Porto district. For this study, only 53 completed all measurements and were included in the analyses. They were encouraged to modify their behaviors participating in an intervention program to provide regular exercise (PE classes 5 days per week). The program lasted 8 months. Height (cm) and body mass (kg) were measured according to standardized procedures. Body mass index (BMI) was calculated from the ratio weight (kg) / height (m)². Percentage of body fat (%) and percentage of trunk fat (%) were obtained through DXA (whole body protocol). Physical activity was assessed with accelerometers and 2000 counts.min⁻¹ was set as the cut point for MVPA. To analyze how variables varied over time, changes [deltas (Δ)] were calculated [8 months (TP1) minus baseline (TP0)]. Independent and dependent Student's T-tests were used to analyze differences between and within genders, respectively. Analysis of Covariance, with adjustments for age and data at baseline, was used to compare changes (Δ) between boys and girls in adiposity and MVPA.



Results

Table 1 describes participants' characteristics and measures of adiposity and MVPA over time. At baseline (TP0), no differences were found between boys and girls. After 8 months of intervention (TP1), boys were more active than girls ($P < 0.05$). There was significant ($P < 0.05$) changes for height, weight, BMI, % of body fat, % of trunk fat and MVPA in boys. In girls, changes were significant ($P < 0.05$) only for height and weight.

Table 2 shows the comparison of estimates [mean (SE)] for changes (Δ) [TP1-TP0] in adiposity and MVPA. In comparison with girls, boys had significant reductions in % of body fat, % of trunk fat, and significant improvements in MVPA.

Table 1 - Descriptive characteristics (Mean±SD) for girls and boys in baseline (TP0) and after eight months intervention (TP1)

	TP 0			TP 1		
	All	Girls	Boys	All	Girls	Boys
Age (years)	10.6 ± 3.5	11.2 ± 3.7	10.0 ± 3.4	10.6 ± 3.5	11.2 ± 3.7	10.0 ± 3.4
Height (cm)	139.9 ± 14.8	140.4 ± 13.9	139.5 ± 15.8	142.7 ± 14.2 ^a	142.9 ± 13.8 ^g	142.4 ± 14.8 ^b
Weight (kg)	46.5 ± 20.9	46.2 ± 18.5	46.7 ± 23.2	47.6 ± 20.9 ^a	47.6 ± 19.3 ^g	47.5 ± 22.7 ^b
BMI (kg.m-2)	22.6 ± 5.7	22.4 ± 5.1	22.8 ± 6.4	22.3 ± 5.8	22.4 ± 5.4	22.3 ± 6.2 ^b
Percentage of Body Fat (%)	37.2 ± 8.2	38.6 ± 5.7	35.9 ± 9.9	36.7 ± 7.9	38.5 ± 5.6	34.9 ± 9.3 ^b
Percentage of Trunk Fat (%)	34.6 ± 9.6	35.9 ± 7.7	33.3 ± 11.2	33.4 ± 9.0 ^a	35.5 ± 7.3	31.4 ± 10.1 ^b
Time in MVPA (min/day)	48.4 ± 23.4	42.3 ± 21.5	55.1 ± 24.2	56.0 ± 27.4 ^a	45.2 ± 25.0	68.0 ± 25.4 ^{b,*}

Notes: * for differences ($P < 0.05$) between sexes; ^a for longitudinal differences ($P < 0.05$) within all subjects; ^g for longitudinal differences ($P < 0.05$) within girls; and ^b for longitudinal differences ($P < 0.05$) within boys.

Table 2 - Estimates [Mean (SE)][#] for changes (Δ) in adiposity and physical activity

	Girls	Boys	F	Partial η ²
Δ BMI (kg.m-2)	-0.111 (0.225)	-0.427 (0.221)	0.984	0.020
Δ % of Body Fat (%)	0.075 (0.437)	-1.180 (0.429)	4.099*	0.077
Δ % of Trunk Fat (%)	-0.287 (0.613)	-2.071 (0.601)	4.231*	0.079
Δ Time in MVPA (min/day)	1.666 (3.753)	14.282 (3.954)	5.139*	0.125

Notes: * for differences ($P < 0.05$) between sexes; # Analyses adjusted for age and data at baseline (TP0)

Conclusions

Significant improvements in body composition and MVPA levels were observed in boys, but not in girls, after 8 months intervention. In accordance with previous findings, these results showed that gender may influence response to intervention programs and generalization of treatment effects may depend on gender-specificities and programs characteristics.