School-based prevention interventions on childhood overweight and obesity in a developing country

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Introduction

The development in middle- income countries has been changed food habits, the consumption of energy dense foods increases and physical activity reduces. In the same way, the carbohydrate intake, in populations with limited resources for its low cost, is contributing to increase prevalence of obesity in children and adolescents. The childhood overweight and obesity are influenced by environmental factors like home where they live and the school, so interventions involving the participation of family and school could be the best to controlling obesity and overweigh.

Objetives

To determine the effectiveness of educational interventions on diet, health and physical activity at school, educators and parents to prevent childhood overweight and obesity in a primary school in Lima, Peru..

Materials and methods

Quasi-experimental non-equivalent group pre-posttest design was performed. We included 37 children´s 4th grade school (intervention group) and their teachers who received complete educational interventions (nutrition, health and physical activities) and 37 children´s 5th grade school (control group) and their teachers who received only dietary educational intervention; parents received dietary and health educational intervention. The intervention was around 4. Primary outcomes were changes in body mass index (BMI), waist and hip circumferences. Study-measured child height and weight were . used to calculate BMI z scores. Data using descriptive statistics (mean and standard deviation) and inferential (t-test) were analyzed; for repeated measures ANCOVA analysis of covariance was used.

Results

Mean of age in control and intervention group were 10.27 ($\pm$0.87) and 9.21 ($\pm$0.75) respectively. The basal measures in control group were 19.92($\pm$3.67), 79.01 ($\pm$7.74) and 67.73 ($\pm$9.28) by BMI, hip and waist circumference respectively and in intervention group were 21.06 ($\pm$4.13), 80.65 ($\pm$8.44) and 70.5 ($\pm$10.23).

A One-way ANCOVA analysis was conducted, there was a significant effect of intervention on the BMI (post intervention) after controlling for the effect of basal BMI, $F (2, 71) = 1372$, $p<0.001$).

The educational intervention reduced around 40% the probability to increase BMI in the intervention group (OR=0.59, CI95%: 0.45-0.78, p<0.001); there were no effect on the hip and waist circumference (OR=0.61, CI95%: 0.24-1.55, p=0.31 and OR=0.48, CI95%: 0.13-1.74, p=0.27, respectively).

Table 1. Mean (SD) of Anthropometric measures Pre and Post Intervention

|	Overall (n=74)	Intervention Group (n=37)	Control Group (n=37)
Pre Intervention			
Weight (cm)	39.30 (9.72)	38.79 (10.38)	39.82 (9.13)
Hip circumference (kg)	79.83 (8.08)	79.01 (7.73)	80.65 (8.44)
Waist circumference (kg)	69.11 (9.83)	67.73 (9.28)	70.50 (10.29)
Post Intervention			
Weight (cm)	39.79 (9.56)	39.33 (10.29)	40.25 (8.87)
Hip circumference (kg)	80.63 (8.21)	80.05 (7.83)	81.20 (8.64)
Waist circumference (kg)	69.6 (9.49)	68.55 (9.19)	70.64(9.79)

Table 2 . Mean of overweight* and obesity*, pre and post educational interventions

	Pre Intervention				Post Intervention			
	Group		Sex		Group		Sex	
	Intervention (n=37)	Control (n=37)	Male (n=41)	Female (n=33)	Intervention (n=37)	Control (n=37)	Male (n=41)	Female (n=33)
Healthy weight	35,14%	56,76%	46,34%	45,45%	40,54%	54,05%	46,34%	48,48%
Overweight	32,43%	21,62%	31,71%	21,21%	29,73%	27,03%	34,15%	21,21%
Obese	32,43%	21,62%	21,95%	33,33%	29,73%	18,92%	19,51%	30,30%

* according to Body Mass Index, BMI was calculated using child's weight and height and was then used to find the corresponding BMI-for-age percentile for child's age and sex

Figure 1. Mean of BMI Pre and Post intervention
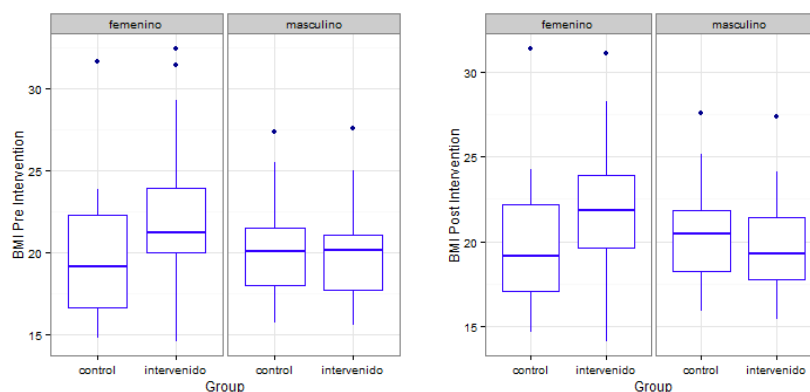
Conclusions

There is an urgent need on effective obesity prevention interventions for children in developing countries. We found a positive effect of educational-intervention on reduction childhood body mass index; our findings suggest intervention effects are promising. Further studies with longer term follow up are required.

References

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