

## School based promotion of sports and physical activity to prevent overweight and obesity in 11-13 year olds

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### Introduction

The incidence of obesity in children and adolescents is growing in both frequency and severity. Obese children are getting more and more overweight. Although obesity-associated morbidities occur more frequently in adults, significant consequences of obesity as well as the antecedents of adult disease occur in obese children and adolescents. Obesity in childhood is often associated with negative psychosocial factors, orthopedic complications and an increased risk for diseases such as hypertension, dyslipemia, hyperinsulinemia, asthma and sleep apnea. In addition, childhood obesity is an important predictor of adult obesity. Therefore, prevention of obesity at a young age is very important for public health.

Most obesity interventions have been conducted in clinical settings. Considering the growing prevalence of childhood obesity, clinical treatment will become very expensive and almost impossible. The problem may be better approached in an educational rather than medical setting, so that clinics and hospitals can concentrate on those children and adolescents with morbid obesity and those whose obesity is accompanied by other medical or psychiatric conditions. The school represents a potentially useful setting for the primary and secondary prevention of obesity. School programs, in contrast with clinical interventions, offer many advantages: large numbers of children can be reached, guidance can be continuous, costs to the parents can be minimized, some children can be reached before their obesity becomes severe, parents can be easily involved in the program and it can be an alternative for children who do not want to join a clinical program. No other public institution has as much contact with children and their parents. Together with *Centres for Pupil Support* (Centra voor Leerlingen Begeleiding), schools have the potential and the personnel (doctor, nurses, psychologist, dietician, physical educator) to promote changes in physical activity. There are also great opportunities to use break times during, before or after the school day for doing physical activities and sports. Most schools have a range of sport facilities and equipment and these are often occupied only partially after school hours. Physical education teachers are the most logical coordinators of a school-based intervention program for the reduction of obesity. Some recent studies have been conducted to assess the feasibility and effectiveness of school-based weight control programs. Most of these interventions were successful in reducing overweight or adiposity, but program effects were mostly not maintained in the long term and implementation in the school system remained problematic. Research is necessary to develop an effective school-based physical activity program that can be easily implemented in Flemish schools.

### Method

A school-based intervention was developed focussing at increasing sports and physical activity at school during school hours, at school outside school hours (lunch breaks, after school, Wednesday afternoon), in leisure time and encouraging active transport.

A quasi-experimental design was used. Because of the higher prevalence of overweight and obesity in schools offering vocation training, a random sample of schools was drawn from the total sample of schools (65). Fifteen schools were randomly assigned to one of three conditions: (1) an intervention condition with parental support, (2) an intervention condition without parental support, (3) a control condition. A total of 2991 students were enrolled in this study. From each school, one randomly selected class was included for more thorough study.

All students filled in questionnaires about physical activity, sport participation, and physical activity determinants. Their height and weight was measured to calculate the body mass index.

In the subsample, participants' physical activity levels were measured using accelerometers and they filled in a 7 days activity diary. In addition fat mass and fat free mass was measured using the Bodystat 1500.

Finally the Cooper test was executed in this subsample to measure physical fitness.

The first research question of this study was to look at the link between sports participation, physical activity, physical fitness and percent body fat. We hypothesise that children with overweight are less physically active, do less sports and perform worse than their normal weight counterparts.

## Results

Table 1: Percentage of youngsters with underweight, overweight and obesity in the sample.

	Standard	BMI	Percentage
Boys	Underweight	<15,5	8,7%
	Overweight	>20	31,2%
	Obesity	>25	5,6%
Girls	Underweight	<16	11,7%
	Overweight	>20,5	35%
	Obesity	>26	8,7%

As shown in table 1, 31.2% of the boys and 35% of the girls were overweight, in addition, 5.6% and 8.7% were found to be obese.

Table 2: Relationship between percent body fat, physical activity and physical endurance

	Percent of fat		
	Boys and girls	Boys	Girls
Moderate to vigorous (CSA)	-0.375***	-0.282**	-0.223*
Physical activity (quest)	-0.254***	-0.143	-0.154
Sports (quest)	-0.242***	-0.099	-0.205*
Active transportation (quest)	-0.095	-0.04	-0.022
Physical endurance	-0.583***	-0.471***	-0.594***

\*\*\* $p \leq 0.001$ , \*\*  $p \leq 0.01$ , \* $p \leq 0.05$

Body composition, represented by percent body fat showed a strong negative relationship with time spent in moderate and vigorous physical activity and physical endurance in both boys and girls. In girls a significant relationship between percent of body fat and reported time spent in sports was also found. For the total sample, a significant negative relationship with percent body fat was found for sport participation, physical activity, CSA measures of moderate to vigorous activity and physical endurance (all  $p < 0.001$ ). No significant relationship was found between percent body fat and active transportation.

## Discussion

These results show a fairly high prevalence of overweight and obesity in 11-13 year olds following vocational training. A negative relationship was with body fat for sports participation, physical activity and physical fitness. Promotion of sports and physical activity is necessary in this age group.

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