



## Fruit and Vegetable consumption and overweight among school-age children within the "COSI" Portuguese Study

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### METHODOLOGY

#### Sample

A full list of all Portuguese private and public primary schools (N=6810) was provided by the Ministry of Education. A simple random two-stage sampling was applied and a nationally representative sample was drawn, with schools as the first unit of sampling. 189 schools were selected. Data from first and second graders (6-8 years old) from 181 primary schools of the seven geographical regions of Portugal (North, Centre, Lisbon and Tagus Valley, Alentejo, Algarve, Azores and Madeira) were collected.

#### Data collection

Height and weight were measured according to international standards, and BMI was calculated. The definition of overweight and obesity was based on average percentiles according to CDC cutoffs defines thinness, overweight and obesity as BMI-for-age < 5<sup>th</sup>, ≥ 85<sup>th</sup> and ≥ 95<sup>th</sup> percentile, respectively. The children's dietary intake was measured using a semi-quantitative Food Frequency Questionnaire completed by the parents. Overall, 3225 questionnaires were returned.

#### Data management

Descriptive analyses of nutritional status and food frequency were calculated. To determine the magnitude of the association between FJVS consumption and overweight, crude Odds Ratio (OR) estimates, including 95% confidence intervals (CI), were computed using unconditional logistic regression.

### INTRODUCTION

Overweight among children has increased dramatically in the last few years and various environmental, genetic and social factors have been associated with weight gain<sup>1,2</sup>.

Promoting fruit and vegetable consumption among children might be useful strategy for weight management in children<sup>3</sup>. However evidence for the association between fruit and vegetable consumption and being overweight in childhood are inconsistent<sup>4</sup>.

The present study aims to predict of fresh Fruit, 100% Juice, Vegetables and Soup (FJVS) consumption among school-age children within the "COSI" Portuguese study and examine whether low consumption of FJVS is associated with obesity in a sample of Portuguese school-age children.

### RESULTS

3765 children were included in the analyses (50,3% boys and 49,7% girls) with a mean age (±SD) of 7,0 years (±0,7). 32,2% children were overweight, 14,6% were obese and 2,1% were thin (Figure 1). According to children's FJVS consumption only 2%, 3,5% and 1,8% ate fresh fruit, vegetables and soup every day, respectively. Otherwise, 21,6% children consume 100% fruit juice every day. There was no difference between FJVS consumption among boys and girls, except for the soup consumption that was higher in girls (p=0,01). There were also no differences between FJVS consumption among age groups. Normal weight children ate FJVS more frequently (≥4 times/week) than overweight and obese children but this differences were not statistically significant.

With regard to FJVS consumption (≥4 times/week and <4 times/week) (Figure 2), no differences between obese and non-obese children were found for fresh fruit (<4 times/week: OR=0,52, 95% CI 0,72-1,17), vegetables (<4 times/week: OR=0,89, 95% CI 0,72-1,10), 100% fruit juice (<4 times/week: OR=1,14, 95% CI 0,90-1,45) and soup consumption (<4 times/week: OR= 0,81, 95% CI 0,62-1,06)(Table 1). The intake of FJVS was not associated with increase risk of obesity in Portuguese school-age children.

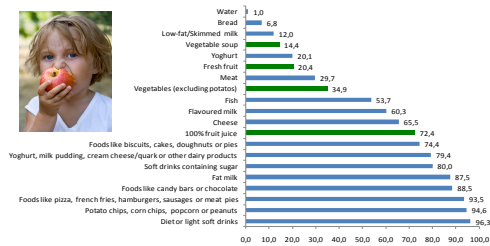


Figure 2 – Food Frequency (≥4 times/week) of children reported by parents.

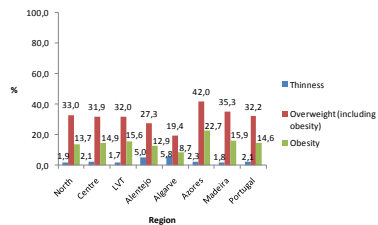


Figure 1 – Nutritional status defined by CDC criteria, by region.

### REFERENCES

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	n	Crude OR	95% CI	p-value
<b>Fresh fruit</b>				
≥4 times/week	98	Ref.	Ref.	
<4 times/week	357	0,92	0,72-1,17	0,48
<b>100% Juice</b>				
≥4 times/week	325	1,14	0,90-1,44	0,27
<4 times/week	110	Ref.	Ref.	
<b>Vegetables</b>				
≥4 times/week	164	Ref.	Ref.	
<4 times/week	277	0,89	0,72-1,10	0,27
<b>Soup</b>				
≥4 times/week	76	Ref.	Ref.	
<4 times/week	380	0,81	0,62-1,06	0,12

Ref., Reference category; 95% CI, 95% Confidence Interval.