



## The development and validation of a novel computer program to assess food and nutrition intake in Portuguese schoolchildren

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### INTRODUCTION

Food and nutrition are important determinants of non-communicable diseases such as childhood obesity which is a public health priority<sup>1-3</sup>. Portugal has shown one of the highest and accelerated increasing rates of childhood obesity in European Union<sup>4</sup>, with an estimated prevalence of overweight of 37,9% and 15,3% of obesity (WHO criteria)<sup>5</sup>. Understanding how to prevent it remains a research question<sup>6</sup>. However the design of potentially effective interventions is hampered by the general lack of good-quality data available<sup>7,8</sup>. There is no validated methodology available to assess food and nutrition intake in schoolage Portuguese children (Figure 1)<sup>9</sup>. The purpose of this study is to develop and validate, for the first time in Portugal, a novel engaging method of assessing food and nutrition intake of schoolage Portuguese children.



**Table 1** – National survey method, year of collection and number of measurements used in the latest national dietary survey (EFSA Journal 2009; 7(12):1435.).

Country	Method	Year of collection	Number of replicates
Austria	24-hour recall	2005-2006	1
Belgium	24-hour recall	2004-2005	2
Bulgaria	24-hour recall	2004	1
Cyprus	Information not available		
Czech Republic	24-hour recall	2003-2004	2
Denmark	Pre-coded food diary with open fields	2000-2002	7
Estonia	24-hour recall	1997	1
Finland	2*24-hour recall	2007	1 <sup>(6)</sup>
France	Dietary record	2006-2007	7
Germany	24-hour recall <sup>(6)</sup>	2005-2007	2
Greece	National dietary survey not available		
Hungary	Dietary record	2003-2004	3
Ireland	Dietary record	1997-1999	7
Italy	Dietary record	2005-2006	3
Latvia	24-hour recall	2008	2
Lithuania	24-hour recall	2007	NA
Luxemburg	National dietary survey not available		
Malta	National dietary survey not available		
The Netherlands	24-hour recall	2003	2
Poland	24-hour recall	2000	1
Portugal	National dietary survey not available		
Romania	Information not available		

### METHODS

A self-administered computerized 24-Hour Recall is being designed to 7-10 years old Portuguese children. From the age of about 7-8 years there is a fairly rapid increase in the ability of children to participate in unassisted recall, but only for food eaten in the immediate past and for no longer than the previous 24 hour. It includes only children below 10 years old because as food portion size will normally increase with age, children's portion sizes must be calculated separately for the different ranges. The user interface is being developed by a computer expert in order to create a novel user-friendly interface to enhance recall and engagement, a method shown to be successful in previous computer-delivered instruments. Food consumption will be evaluated by food photographs based on a set of typically food portion weights for 7-10 years old children that are being produced and tested specifically for this study.

The research has the following chronological developmental phases:

#### 1) Questionnaire food items selection and psychometric tests (reliability and validity tests)

Questionnaire items selection (foods and drinks) are being generated from: 1) Literature from previous studies; 2) Focus Groups with children from the seven regions of Portugal and 3) Expert Opinion (Nutritionists, Paediatricians, and Epidemiologists). Expert opinion will ensure the content validity of the questionnaire.

Test-retest reliability and internal consistency will be use to assess reliability and stability over time based on the scores of the respondents. To assess construct validity, spearman correlation coefficients will be calculated between the results obtained through this questionnaire and doubly labeled water that is considered to be the gold standard reference method for validation of measurements of energy intake.

#### 2) Pilot Study

After the validation and reliability tests, a pilot study will be developed in order to assess the adequacy of the questionnaire developed. Two days of dietary intake will be evaluated because one administration of the 24-Hour Recall is of little use in estimating children's usual energy and nutritional intake.



### RESULTS (expected)

Developmental of a novel, valid and engaging method of assessing food and nutrition intake, set within a user-friendly interface and the collection of valid information about food and nutritional intake of school age Portuguese children.

The design and implementation of this study will be an essential prerequisite for monitoring the nutritional status of school age Portuguese children as well as will lead to perform several epidemiological researches on the links between diet and health, which help develop sound public health policy, direct and design health programs.

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