Evaluation and Program Planning 66 (2018) 1–6

Contents lists available at ScienceDirect

Evaluation and Program Planning

journal homepage: www.elsevier.com/locate/evalprogplan

Consumption of foods and beverages in elementary schools: Results of the implementation of the general guidelines for foods and beverages sales in elementary schools in Mexico, stages II and III

Nancy López-Olmedo, Alejandra Jiménez-Aguilar*, María del Carmen Morales-Ruan, Mauricio Hernández-Ávila, Teresa Shamah-Levy, Juan A. Rivera-Dommarco

National Institute of Public Health, Av. Universidad No 655, Col. Sta. Ma. Ahuacatitlan, C.P. 62100, Cuernavaca, Morelos, Mexico

ARTICLE INFO

Keywords:
Mexico
Children-obesity
Nutritional-guidelines
Food policies

ABSTRACT

The Mexican government developed the General Guidelines for the dispensing or distribution of foods and beverages at food sales in elementary schools (Guidelines).

The objective is to evaluate the consumption of food and beverages during school hours, in two different stages of the implementation of the Guidelines: stages II (2011–2012) and stage III (2012–2013) in 565 elementary school students.

We constructed three categories of consumption according to the origin of food: *Home*, food brought from home; *School*, food purchased at school and *Both*, food from home and food purchased at school.

The main results showed that there are differences in both stages in energy intake according to the foods' origin; the category of *School* has the lowest energy and macronutrients consumption, as well as the closer compliance with de Guidelines recommendations in both stages, while the category of *Both* has a higher consumption and the less compliance with the Guidelines. This may be indicating an improvement in school guidelines and it is also reflecting the need to reinforce orientation for a healthy diet with respect to foods brought from home. It is necessary to continue with periodic evaluations to measure fulfillment with the Guidelines.

1. Introduction

Overweight and obesity in children have become a worldwide public health problem and are currently posing a major challenge given their magnitude, the rate at which they are increasing and their health and economic consequences, especially when occurring at an early age (Dietz, 1998; Han, Lawlor, & Kimm, 2010; Must & Strauss, 1999; Reilly et al., 2003).

According to a systematic review, between 42.5 and 51.8 million children aged 0–19 years are affected by obesity in Latin America, i.e. approximately 20–25% of the population, with Mexico presenting the highest prevalence of overweight and obesity in the region (Rivera et al., 2014).

A problem of this magnitude demands immediate action to halt its progress. The World Health Organization (WHO) recommends multifactorial interventions at different levels to prevent and attack the rapidly spreading conditions of overweight and obesity in the population. A substantive change can be achieved only by means of interventions involving coordinated efforts on the part of the government, industry, community organizations, schools, family and healthcare professionals, each with specifically defined actions (World Health Organization, 2003).

The WHO has also indicated that the most cost-effective interventions for the prevention of overweight and obesity among the pediatric population are those that use school and family settings to promote healthy eating habits and physical activity by raising awareness and by implementing public policy strategies at schools (World Health Organization, 2008). In response to the WHO recommendations, the Mexican government declared the National Agreement for Healthy Nutrition (ANSA by its Spanish acronym). The ANSA was designed to both prevent the incidence and reverse the progress of obesity and noncommunicable diseases through the following actions: improving the supply of and access to healthy foods and promoting physical activity at all stages of life. To achieve this, efforts and commitments were engaged from different levels of government, the food industry, the academy and civil society. As a result, the Ministries of Education and

* Corresponding author.
E-mail address: aljimenez@insp.mx (A. Jiménez-Aguilar).

http://dx.doi.org/10.1016/j.evalprogplan.2017.08.009
Received 31 August 2016; Received in revised form 7 August 2017; Accepted 14 August 2017
Available online 25 August 2017

Health developed a joint intervention featuring General Guidelines for the dispensing and distribution of foods and beverages at food stores in elementary schools (Guidelines) (Hernández & Martínez, 2011).

The ANSA Guidelines pursue the following objectives: (1) promoting healthy eating habits and a healthy environment in schools; (2) fostering the adoption of healthy diets as a means of preventing overweight and obesity, and (3) regulating the types of foods and beverages not/recommended for sale in stores, cooperative stores and all retail centers or spaces within elementary schools, i.e., those attending to children from 3 to 15 years of age (Hernández & Martínez, 2011).

Application of the Guidelines is underpinned by a set of norms: Food and beverages sold in schools must be pre-authorized by the school principal and supervised by a committee of parents responsible for observing that the foods and beverages sold are healthy and hygienically prepared. Food and beverages must be offered by school stores and must be served by parents or street vendors who introduce the products in the school facility at recess and/or lunchtime.

Implementation of the Guidelines was introduced in stages to give the food industry time to modify the nutrimental content of its manufactured food products. Adjustments were required not only to industrial processes, equipment and containers, but also to the country's agricultural production so as to ensure availability of the new ingredients (Charvel, Cobo, & Hernández, 2015). Transitioning from Stage II to Stage III entailed a number of requirements, namely, lowering the cut-off points for (a) the total fat and sugar contents of food in general; (b) the total fat, saturated fat and sodium contents of prepared foods; (c) the total fat, saturated fat and sodium contents of snacks; and (d) the total fat, saturated fat, added sugars and sodium contents of cookies, small cakes and sweets. It also included compliance with the recommended portion size of yogurts and the recommended portion size and calorie content per serving of fruit, nectars, vegetable juices (the latter must be 100% natural) and soy-based beverages. Finally, Stage III required the incorporation of whole grain cereals among foods sold at school (SEGOB, 2014b).

Incorporated as a fundamental component of ANSA application, periodic evaluations of the Guideline implementation stages were designed to obtain operational feedback, propose improvements, and measure the medium- and long-term impact of the Guidelines on food consumption among children.

In June 2011, Implementation Stage I was evaluated across a nationally representative sample of 600 elementary and middle schools, both public and private. At that point, an assessment of the opinions, knowledge and actions of key actors (school principals, teachers, vendors, and parents) indicated that the Guidelines had been fully implemented in 73.6% of schools, partially implemented in 22%, and not implemented in the rest (unpublished results reported by the Indagaciones y Soluciones Avanzadas survey company).

Over 80% of principals, professors and vendors, and 77% of parents reported that the Guidelines had accomplished the objective of improving availability of healthy foods and beverages in schools (unpublished results reported by the Indagaciones y Soluciones Avanzadas survey company).

Because providing healthy food and beverages and restricting energy-dense foods in schools can reduce energy consumption in children (Briefel et al., 2009), the Guideline implementation can help children to acquire healthier foods and beverages with a lower energy content at school.

The aim of our study was to evaluate consumption of foods and beverages by elementary school students during school hours throughout stages II and III of Guideline implementation, and to assess whether the amount of energy they consumed from food purchased at school differed from that consumed from home-packed food.

2. Methods

2.1. Study design

A cross-sectional descriptive study with national representativeness and a complex design (two-stage process by clusters and stratified at school level) was conducted at two different points in time: Stage II was evaluated in June 2012 and Stage III in April 2013.

Sample selection was randomized in clusters of schools grouped by locality. For Stage II, the clusters were split into four strata representing public and private, and elementary and high schools. The sample in this stage was planned to be representative to all elementary schools, public and private classification was used only as a stratification criteria. For Stage III, the clusters comprised public elementary schools only because private schools were significantly fewer and did not implement the strategy properly. The study sample was distributed proportionately among strata according to the number of schools analyzed. We collected general information on Guideline implementation from 122 public and private elementary schools in 2012 and from 110 public elementary schools in 2013.

2.2. Study population

Food and beverage consumption was evaluated in a subsample of elementary schools randomly selected for Stage II of Guideline implementation (44 public and 6 private schools). Per capita energy consumption per day was selected as a target in order to determine the sample size of children (both sexes) for the study. We established a standard deviation of 350.45 kcal, the same as that reported in a previous study (Rivera et al., unpublished results) and an error limit of 77 kcal per day. To achieve a 95% confidence level, a no response rate of 20% and a cluster design effect of 2.0, a total of 198 children were analyzed in Stage II: four children aged 9–10 years were randomized from each school.

For Stage III, we evaluated food and beverage consumption in all the selected schools (110 public elementary schools). To achieve an error limit of 52 kcal per day using the same parameters as in Stage II, we estimated a sample of 436 children. Upon selecting, four children per school, the sample rose slightly to 440 children.

Our final samples consisted of 167 children for stage II and 396 for stage III. We obtained a school response rate of 100% in both stages and response rates of 83% and 90% in Stages II and III, respectively. The present analysis included only the 44 public schools considered in Stage II and the 110 public schools considered in Stage III.

2.3. Instruments and data collection methodology

We used direct observation to gather information on the solid foods and beverages, both those purchased from the school food stores as well as those brought from home to eat during recess. Registered data included foods and beverages, added ingredients and amounts consumed.

2.4. Study variables

We obtained estimates (in grams or milliliters) for each food item consumed per child at recess. Analysis included intake of energy, proteins, total sugars, total fats, trans/saturated fats and sodium based on the nutritional composition tables compiled and updated by the National Institute of Public Health (INSP by its Spanish acronym) (INSP, unpublished results). The compilation database was built with information from 14 different sources, particularly from tables containing the nutritive values of the foods most frequently consumed in Mexico (Ledesma, Chávez, Perez-Gil, Mendoza, & Calvo, 2010), tables containing the fatty acid composition of common foods in the Mexican diet (Villalpando, Ramírez, Bernal-Medina, & De la Cruz, 2007), the USDA National Nutrient Database for Standard Reference, and the