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Development of an educational intervention to promote healthy eating and physical activity in Mexican school-age children

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ABSTRACT

Mexico has the highest and most alarming rates of childhood obesity worldwide. A study conducted in the State of Mexico revealed that one of every three children presents overweight or obesity. The objective of this paper is to provide a step-by-step description of the design and implementation of an educational intervention to promote healthy eating and physical activity called "Healthy Recess". The educational intervention was designed using the six stages of the Health Communication Process. This methodological model allowed identifying the needs of school-age children on information and participation in activities. In order to improve the strategy, adjustments were made to the print and audiovisual materials as well as to assessment tools. Typography was modified as well as the color of the images in student's workbook and facilitator's; special effects of the videos were increased; the narration of the radio spots was improved and common words and phrases were included. The Health Communication Process is an effective tool for program planners to design interventions aimed at managing prevalent health problems such as overweight and obesity in school-age children.

1. Introduction

Mexico has the highest and most alarming rates of childhood obesity worldwide (Harvard School of Public Health, 2014; OECD, 2014). Data from the 2012 National Health and Nutrition Survey (Gutierrez et al., 2012) revealed that 34.4% of Mexican school-age children (5–11 years of age) have an unhealthy weight. In particular, a study conducted in the State of Mexico with the population from the school breakfast program provided by the State System for Comprehensive Family Development of the State of Mexico (DIFEM, Spanish acronym) observed that one of every five school-age children was overweight or obese, 50% of whom presented physical inactivity (Shamah et al., 2012).

Obesity in children and adolescents is associated with diseases such as insulin resistance syndrome (Burrows, Collins, & Garg, 2011), diabetes, hypertension, sleep apnea, and orthopedic problems, among others (Lobstein, Baur, & Uauy, 2004). Another consequence of obesity in children is low self-esteem, discrimination and exclusion by schoolmates (Puhl & Latner, 2007). Therefore, it is necessary to develop health programs that contribute to the reduction and prevention of this disease.

Several strategies, particularly those developed in school settings, have shown positive effects on the weight of children (Brown & Summerbell, 2009; Perez-Morales, Bacardi-Gascon, Jimenez-Cruz, & Armendariz-Anguiano, 2009). For this reason and in response to the needs expressed by the DIFEM, the Mexican National Institute of Public Health developed the "Nutrition on the Go" strategy, which is aimed at preventing and containing obesity in the school-age population. This strategy consists of four components, among which is the design of an educational intervention to be implemented in schools for healthy eating and physical activity called "Healthy Recess".

In Mexico other models of school interventions have being used to promote healthy behavior, like the operative psychology approach (Elder et al., 2014) the social marketing (Carriedo et al., 2013) and the ecologic and social cognitive theory model (Safdie, Cargo, Richard, & Lévesque, 2014). However the health

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communication model was chosen due to the strength that it provides by considering in the diagnostic the needs, perceptions and strengths of the population for which the intervention is designed for. Likewise it takes into account the intervention design, planning, implementation and evaluation. (PAHO, 2001; U.S. Department of Health and Human Services, 2002). This provides a feedback and allows making enhancements to the intervention program.

The objective of this paper is to provide a step-by-step description of the design and implementation of this intervention using the Health Communication Process (PAHO, 2001; U.S. Department of Health and Human Services, 2002) which takes into account the needs and perceptions of the selected audiences. Moreover, this process is a useful strategy in health promotion because it shows a practical schema to plan and execute programs from the community's perspective. It allows identification of problems and creation and validation of materials and use of mass media to transmit information.

1.1. Theoretical framework

Development of strategies and interventions in health grounded in theoretical and methodological models increases the likelihood of achieving the objectives (Mosqueda, 2003). For the development of this intervention, three theoretical approaches and a methodological model for planning health programs were used: (1) Theory of cognitive development (Piaget, 1972) in which the way the child interprets the world and improves his ability to handle concrete and formal operations according to age is shown; (2) Social Development Theory (Vigotsky, 1978; Bandura, 1977) raises the acquisition of knowledge by observation and how the modification of behavior occurs by continuous and mutual interaction between the child and his environment and (3) Ecological Model (McLeroy, Bibeau, Steckler, & Glanz, 1988) as a framework, focusing on multilevel influences in the permanent interaction between the environment and individual and social dimensions, useful for the management of health behaviors and health promotion. These models and theories are considered the basis of the Health Communication Process because they facilitate the understanding of risk behaviors and the recognition of alternatives for its modification.

The Health Communication Process was used as a methodological model that underpins the development of intervention, rigorously allowing systematic planning, implementation and evaluation of health campaigns or programs. Fig. 1 illustrates an approach to health communication originating from the needs and perceptions of the target population (PAHO, 2001). Its six stages constitute a circular process in which the last stage feeds back to the first in an ongoing process of planning and development. The following describes each of these:

Stage 1: planning and selection of strategies is the initial stage where the Health Communication Process is based upon. The decisions made here guide *Stage 2: selection of audience, contents, materials and communication channels*, which are expected to be effective for the audience and for addressing health problems. Stages 1 and 2 provide the basis for *Stage 3: development of materials and preliminary tests* in which work is undertaken with the selected audiences in determining messages and materials. The definition of this stage gives way to *Stage 4: implementation* where the fully developed program is presented to the target audience, promotion and distribution of materials begins and a regular evaluation is performed. In *Stage 5: evaluation*, the program is evaluated by analyzing the results and the desired effect during its development. Finally, in *Stage 6: feedback of the program*, a new cycle is prepared from information collected in each of the stages, which allows editing and refining (PAHO, 2001).

2. Methods

2.1. Stage 1: planning and selection of strategies

At this early stage a diagnosis of the target population was conducted using information from secondary sources associated with socioeconomic indicators such as age, sex, marital status, education, and income, among others, to infer the problems and needs of the community (Brown & Summerbell, 2009).

Additionally a literature review about similar strategies on feeding and physical activity in scholar population was made, this allowed us identify key issues such as proper diet and physical activity, emphasizing knowledge, beliefs and practices as determinants in the adoption of healthy behaviors for the management of overweight and obesity (Bruss, Morris, & Dannison, 2003; Ministerio de Sanidad, 2007; Olivares, Bustos, Moreno, Lera, & Cortez, 2006).

These elements guided the definition and structure of the activities, as well as the data gathering instruments.

For this purpose, focus groups were conducted as a qualitative technique (Krueger, 1991) to explore the knowledge, beliefs and practices of school-age children around their eating habits and physical activity. There were three main activities of the focus groups:

- Creating a story in which the school-age children reported their everyday eating habits and physical activity.
- "Traffic light", an activity where children classified cards with images, using the colors green or red, the food or physical activity according, to their knowledge beliefs and/or common practices. The green color was for foods or activities considered as healthy, red color was used for those non healthy. I.e. to classify an apple and a hamburger, to watch TV or swimming. The decision to exclude the yellow color from the traffic light (equivalent to neutral or uncertain) was intentional searching for a deeper thinking about the answers form the participants (Converse & Presser, 1986) as well as to increase the data quality (Klopfer & Madden, 1980).
- Development of a drawing that allowed us to know their expectations, make suggestions and show their classmates the importance of eating healthy foods or getting regular exercise.

A probabilistic sampling was performed to select six public elementary schools (three urban and three rural). A total of 24 focus groups were conducted, four in each school, around the following themes: (1) nutrition at school, (2) nutrition outside school, (3) physical activity at school, (4) physical activity outside school. The groups were comprised of school children between 8 and 12 years of age. The sessions were conducted in schools hours, by psychologists and educators previously trained and standardized in the focus groups technique with the objective of ensure the data quality. Each group consisted of a minimum of six participants and a maximum of eight. The length of each session was ~60 min. Parental consent was obtained as well as children's approval to participate and be filmed and photographed.

Analysis of the information gathered was from the phenomenological perspective by establishing a priori categories: observed practices, expected practices, knowledge, perception of healthy eating or physical activity and differences by gender. In order to systematize the data, the information was processed through the NVivo versión 2.0 (Silva, Lopes, & Diniz, 2008), program for qualitative analysis and verified by various professionals.

The results showed that girls and boys clearly identify the natural foods and those that have nutrients as proteins, vitamins and minerals as healthy foods. Among the healthy foods fruits, vegetables and pure water are mentioned. On the other hand they spot soft drinks and fat and sugars rich foods as "Junk Food" and