

Food and nutrition educational action for students: an experience report

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An article based on the master's degree dissertation of the Postgraduation Program in Collective Health of the Institute of Collective Health at Brazilian Federal University of Mato Grosso, thesis defense in 2011, called schoolchildren's food consumption before and after nutrition education actions, in the Brazilian city of Cuiabá, MT.

Funding: Fundação de Amparo à Pesquisa do Estado de Mato Grosso (FAPEMAT; Research Support Foundation of the Brazilian State of Mato Grosso), Process 469031/2009.

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Abstract

Objective: This article aims to describe a successful experience of food and nutrition education activities (EAN) with students. *Methods:* This report is based on a randomized community intervention developed with students from a public school in Cuiabá, Mato Grosso state, Brazil. The intervention consisted in 11 meetings at a school about nutrition education, lasting 60 minutes each. Expositive and dialogued classes and ludic activities related to the theme of each meeting were provided. For this, we used posters, videos, games and activities and clipping collage as teaching support material. *Results:* The main theme of food and nutrition education actions was healthy eating, emphasizing the reduced consumption of foods considered less healthy like candies, sodas and fries, encouraging increased consumption of fruits and vegetables and consumption of the school lunch instead of the unhealthy snacks offered by school cafeterias, grocery stores near the school and food brought home to be eaten at school. The use of games and playful activities was well accepted by the students. Besides the concepts of nutrition, we could stimulate their creativity and autonomy. *Conclusion:* The methodology used in this study shows to be effective, since satisfaction was observed with the school activities taught. It is recommended that food and nutrition education actions integrate the school curriculum, planned by a multidisciplinary team and serve as an aid in planning future actions.

Keywords: Food and Nutrition Education. School Eating. Food Consumption. Students. Intervention Studies.

Introduction

The Brazilian government *National Policy on Food and Nutrition* (National Food and Nutrition Policy, PNAN in the Portuguese abbreviation) has as its guideline the promotion of adequate and healthy food practices comprising a set of activities aiming to provide nutritionally adequate food practices in harmony with the individuals' and communities' biological and sociocultural aspects. Brazilian government *Educação Alimentar e Nutricional* (Food and Nutrition Education, EAN in the Portuguese abbreviation) integrates these activities in conjunction with food regulation and encourages the creation of environments promoting healthy eating, such as workplaces and schools.¹

In schools, EAN activities are among the priority axes of the Brazilian government *Programa Nacional de Alimentação Escolar* (National School Lunch Program, PNAE in the Portuguese abbreviation), helping schoolchildren in the voluntary adoption of healthy food choices.^{2,3}

Through current dietary and nutritional problems, EAN is consolidated as an important health promotion strategy. Its activities are based on different educational and pedagogical approaches that foster dialogue and reflection on aspects related to food and nutrition throughout the individuals' life.^{4,5}

It is an intersectional and multidisciplinary field. Therefore nutritionists must work together with other professionals in order to prepare and execute the activities, sharing experiences in planning food and nutrition education activities. In school communities, principals, coordinators, teachers, cooks, owners and employees of school canteens are professionals who should be encouraged to be involved in these activities to diversify educational methods and bring together technical and popular knowledge.^{5,6}

The teaching-learning methods used in EAN activities should differ according to the environment and the target audience. And for the choice of methods and topics, it is important to perform a diagnostic evaluation through interviews or questionnaires. The use of ludic activities, especially with schoolchildren, has been shown to be effective in increasing knowledge about food and nutrition, as they stimulate the understanding of the content approached in a pleasant way and reflect the reality experienced in their age group.^{7,8}

Despite the recognition of the importance of the EAN, there is a diversity of approaches used and few reports of experiences. Thus, the discussion about the possibilities, limits and methods used in accomplishing it is still scarce.

The present article proposes to describe an experience of food and nutrition education activities with schoolchildren.

Methods

This is a description of an experience of EAN activities developed in a state public school, located in the urban area of the Brazilian municipality of Cuiabá, state of Mato Grosso. The food and nutrition education activities reported are part of a larger intervention project, entitled “Schoolchildren food consumption before and after nutrition education activities, in Cuiabá, MT.”⁹ The study was conducted from March to June 2010 with 49 students aged 8 to 14 years, enrolled in the 5th year of elementary school.

For the diagnostic evaluation of the population studied, the sociodemographic variables analyzed were gender, age and per capita monthly income (in minimum wages per capita), classified according to the Brazilian government *Instituto Brasileiro de Geografia e Estatística* (Brazilian Institute of Geography and Statistics, IBGE in the Portuguese abbreviation).¹⁰ The minimum wage in force in the country during the period of the survey was BRL 510.00.

The students’ nutritional status was also determined using the Body Mass Index (BMI) based on weight (kg) and height (m) measured according to the recommendations by Jelliffe.¹¹ For the BMI classification by age, the cut-off points recommended by the World Health Organization¹² were adopted and the results were categorized into overweight and normal weight.

A semi-structured questionnaire was applied to supplement the diagnostic evaluation and for planning food and nutrition education activities, with questions related to food consumption in school lunch, school cafeteria, a grocery store near the school and food brought from home to the school environment, results that can be seen in Prado et al.¹³ Thus, an intervention project was prepared, consisting of food and nutrition education activities carried out in 11 meetings at the school lasting 60 minutes each. Activities were carried out by two researchers named “leading researcher” (nutritionist) and “research associate” (physical educator) who addressed the topics: food pyramid,¹⁴ food groups with presentation of the main nutrients¹⁵ and healthy eating.¹⁶

At each meeting, there were lecture and discussion sessions lasting approximately 20 minutes, followed by ludic activities corresponding to the topic of each meeting. For this, posters, videos, games and clipping and collage activities were used as a support material. Videos would be carefully selected from the Internet, and posters, games and clipping and collage activities were made by the leading researcher using recyclable materials such as PET (polyethylene terephthalate) bottles and shoe boxes. At the beginning of each meeting, previously discussed concepts that emerged throughout the meetings would be retrieved through the interaction between students and researchers.

The research was approved by the Research Ethics Committee (REC) of Brazilian Hospital Universitário Júlio Müller (Júlio Müller University Hospital) of Universidade Federal de Mato Grosso (Federal University of Mato Grosso) under registration no. 734/CEP-HUJM/09. The authors declare no conflicts of interest in the development of this research.

Results and Discussion

This paper reports an experience based on food and nutrition education activities with students aged 8 to 14 years in a state school in the Brazilian city of Cuiabá, MT.

Data from the diagnostic evaluation showed that the study population consisted of 49 students, being 58% females, and with a mean age of 10.2 years. Regarding families' income, 58% of the students' families had a monthly income per capita of less than 0.5 minimum wages and 42% had a monthly income of 0.5 to 2.99 minimum wages per capita. Regarding the students' nutritional status, 13.3% were overweight.

The semi-structured questionnaire results indicated a high consumption of unhealthy foods, such as candies, soft drinks and fried foods in the school environment, bought in cafeterias, grocery stores near the school and food brought from home.¹³ Therefore, the main topic chosen for the food and nutrition education activities was healthy eating, with emphasis on reducing the consumption of foods considered unhealthier such as candies, soft drinks and fried foods. Consumption of fruits, potherbs and school lunches was encouraged to the detriment of the unhealthy snacks offered by school cafeterias, grocery stores near the school, and food brought home to be consumed in the school environment.

The topics, programmatic contents and activities carried out at each meeting for food and nutrition education activities are described in Table 1, where for each topic the importance, food source and recommendations of each group of the food pyramid were described, as well as recreational activities such as clipping and collage, theater and games.

Table 1. Description of topics, program content and play activities worked out at food and nutrition education meetings. Cuiabá-MT, 2010.

Topics	Program content	Activities
Food pyramid	<ul style="list-style-type: none"> – The importance of the food pyramid; – Identification and importance of food groups (carbohydrates, oils and fats, sugars, potherbs, fruits, vegetables, milk and dairy products and meat and eggs); – Number of calories and portions recommended for each group. 	<ul style="list-style-type: none"> – Clipping and collage the food pyramid
Cereals, tubers, breads and roots	<ul style="list-style-type: none"> – The importance of cereals, tubers, breads and roots; – Carbohydrates and their importance; – Food sources; – Number of calories and servings recommended according to Brazilian government <i>Guia Alimentar para a População Brasileira</i> (Food Guide for the Brazilian Population). 	<ul style="list-style-type: none"> – Carbohydrates hunting game
Potherbs	<ul style="list-style-type: none"> – Importance of potherb food group; – Vitamins and minerals and their importance; – Food sources; – Number of calories and servings recommended according to Brazilian government <i>Guia Alimentar para a População Brasileira</i> (Food Guide for the Brazilian Population); 	<ul style="list-style-type: none"> – Potherbs memory game.
Fruits	<ul style="list-style-type: none"> – Importance of fruits; – Vitamins and minerals and their importance; – Food sources; – Number of calories and servings recommended according to Brazilian government <i>Guia Alimentar para a População Brasileira</i> (Food Guide for the Brazilian Population); 	<ul style="list-style-type: none"> – Domino game of fruits

to be continued

<p>Milk and dairy products</p>	<ul style="list-style-type: none"> – Importance of milk and dairy products; – Calcium and its importance; – Food sources; – Number of calories and servings recommended according to Brazilian government <i>Guia Alimentar para a População Brasileira</i> (Food Guide for the Brazilian Population); 	<ul style="list-style-type: none"> – Bowling game for milk and dairy products.
<p>Meat and eggs</p>	<ul style="list-style-type: none"> – The importance of meat and eggs; – Proteins and their importance; – Food sources; – Number of calories and servings recommended according to Brazilian government <i>Guia Alimentar para a População Brasileira</i> (Food Guide for the Brazilian Population); 	<ul style="list-style-type: none"> – Meat dish game.
<p>Vegetables</p>	<ul style="list-style-type: none"> – The importance of vegetables; – Iron and its importance; – Food sources; – Number of calories and servings recommended according to Brazilian government <i>Guia Alimentar para a População Brasileira</i> (Food Guide for the Brazilian Population); – Demonstration of 4 vegetables (soybeans, peas, beans and lentils). 	<ul style="list-style-type: none"> – Collage activity of dried vegetable servings.
<p>Oils and fats</p>	<ul style="list-style-type: none"> – The importance of oils and fats; – Fats and their importance; – Food sources; – Number of calories and servings recommended according to Brazilian government <i>Guia Alimentar para a População Brasileira</i> (Food Guide for the Brazilian Population); 	<ul style="list-style-type: none"> – Surprise theater during a dialogue exhibition on the consumption of packaged snack foods; – Clipping and collage activity of foods rich in oils and fats.

to be continued

Sugar and candies	<ul style="list-style-type: none"> – The importance of sugar and candies; – Food sources; – Number of calories and servings recommended according to Brazilian government <i>Guia Alimentar para a População Brasileira</i> (Food Guide for the Brazilian Population); 	– The healthy child game.
Healthy eating	<ul style="list-style-type: none"> – Food laws; – How to prepare a healthy meal by choosing healthy foods; – The importance of every meal; – Suggestions for an ideal menu for each type of meal; – The importance of breakfast; 	– The healthy eating game.
Videos about healthy eating	<p>An approximately 25-minute video on the following topics:</p> <ul style="list-style-type: none"> • Breakfast; • Milk and dairy products; • How bread is made; • Fruits; • Conserving water; • Where does salt come from? • Where does egg come from? • Getting to know foods; • Child obesity. 	– Videos about healthy eating.

To integrate the team of researchers, in addition to the nutritionist, a Physical Education professional was chosen, as their ability to practice group activities and the importance of multidisciplinary activities in accomplishing this type of intervention, verified during the meetings, are recognized.

In order to make the activities enjoyable for both the educator and the student, an affective link was sought between them during the activities of nutrition education since, according to Freire,¹⁷ technical competence and love are educational relationships essential to the success of learning.

The affective bond allowed to direct the content of the activities to the students' reality, addressing the nutritional issues revealed in the application of the semi-structured questionnaire.

Thus, in the EAN activities, methodological strategies inherent to the age group studied were adopted, such as lectures, dialogues and ludic activities.

At the first meeting, on the topic “food pyramid,” the researchers introduced themselves aloud and each student was identified with an orange-shaped badge. The choice was for working with the Food Pyramid Adapted for the Brazilian Population,¹⁴ since eating guides serve as guidance and information instruments for the population, aiming at promoting health and the adoption of healthy eating habits. Yokota et al.¹⁸ have also used the food pyramid as an instrument for food and nutrition education with students and teachers and obtained positive results from the intervention.

Philippi et al.¹⁴ emphasize the importance of working each food group, highlighting its importance, food sources and recommendations, so that the main objective is achieved, i.e., the adoption of healthy eating. In this way, each food group was worked separately, including, at the end of each meeting, a playful activity with existing games adapted to the concepts of healthy eating. Opting for games is based on the point of view that for human beings learning is as important as social development and games are a pedagogical tool that promotes both cognitive and social development. Pedagogical games should promote joy, pleasure, fun, and thus learning,¹⁹ which was observed throughout the educational process.

At the meeting on the food group “Cereals, Tubers, Breads and Roots,” the activity “carbohydrates hunting game” was carried out and carbohydrates main function, which is to generate energy to the body, was demonstrated by means of the energy expended for “running” in search of food images. The students were encouraged to identify the errors and thus fix the content addressed.

During the meeting on potherbs, it was observed that many students did not know some of them, such as chard, arugula, turnip, zucchini, among others. The most cited potherbs were carrots, tomatoes, lettuce and cabbage, which corresponds to the most consumed foods by the Brazilian population.²⁰ Therefore, the students were asked to go to the market with their parents/guardians to get to know better the vegetables mentioned in the classroom. The “potherbs memory game” stimulated curiosity in identifying each potherb illustrated in the game cards.

At the meeting about fruits, some students reported the experience of going to the market to identify the potherbs presented in the previous class. According to Freire,²¹ concrete situations of reality help in the construction of knowledge based on their experience and possibilities, excluding education based on singular and vertical dialogue between the educator and the student, in which reality becomes something static and distant from their individual reality and experiences. Through the formative evaluation process, it was noticed that the activity proposed reached the objective of awakening curiosity and constructing knowledge that make up learning in the classroom.

In addition to the most consumed fruits, students cited regional fruits and preparations such as grugru palm (*Acrocomia aculeata*), souari nut (*Caryocar brasiliense*) and banana farofa, which is a regional preparation based on plantains (or cooking bananas, sometimes also referred to as green bananas). Thus, as a way of valuing activities that respect and perpetuate individuals' traditions and cultural and food history,²² the consumption of fruits harvested in their own garden was encouraged, which is a common practice in the Brazilian municipality of Cuiabá, MT, and the region. Appreciation of the local culture was also carried out by Boog²³ in her intervention study with a rural school community, in which she encouraged the consumption of food produced in the region, generating great interest from the students, since the activities reflected their own daily life and valued the families' work, history, cultural identity and self-esteem.

During the meeting on milk and dairy products, students reported low consumption of this food group, which would be replaced by tea and coffee consumption. Gambardella et al.²⁴ have found a relation between low consumption of milk and dairy products and skipping breakfast, since these foods usually make up this meal. In the present study, students also reported low breakfast frequency, which may explain the low consumption of milk and dairy products.

At the meeting on meat and eggs, the consumption and preparation of these foods (baked, cooked, sautéed, grilled and fried) were discussed. It was observed that students reported frequent consumption of regional preparations such as chicken and rice and the so-called "maria isabel" (rice and dried meat), as well as an excessive consumption of cured dry food such as sausage and frankfurter.

During the meeting on vegetables, the lack of knowledge about soybeans, lentils, dry peas and different types of beans such as black-eyed beans, brindle, among others was noted. The majority knew only canned peas, pinto beans and black beans. Also, a sensorial analysis of vegetables was carried out through tact and smell, as this technique allows the recognition of foods, increasing positive decisions in the experimentation of new foods,²⁵ a behavior observed in students when requesting portions of food so that they could try them at home.

The meeting on oils and fats was started with an improvised staging on the consumption of candies and packaged snack foods. The research associate walked into the room, greeted the students, opened packaged snack foods and candies and began to eat them. At this moment the students were excited, saying that he could not eat those foods because they were bad for his health. Thus, a discussion began on the consumption of packaged snack foods and candies.

The literature shows that the use of dramatization as an instrument of education allows an interaction between the educator and the learner and its use can favor access to the learner's affective and emotional levels, once language that is appropriate to the target audience is used and learners' participation is made possible.^{26,27} Experiences considered positive were reported by

Toassa et al.,²⁸ who used drama and group dynamics with students to address issues of nutrition and quality of life, and by Souza & Boas,²⁹ who used puppet theater with children and adolescents to address the importance of vitamin A. In the present study, the students' interest in participating in the dramatization was noticed, demonstrating knowledge about the harms from these foods to the health.

At the meeting on sugars and candies, a game was played aiming to extract from boxes images of foods (sugars and candies) which in excess can cause several diseases. It was noticed that there was an active participation from the students and an understanding of the activity.

At the meeting on the topic of "healthy eating," the topic "breakfast" was the most discussed by students, since many reported fasting in the morning. Therefore, the first meal of the day would be the school lunch, that is, two to three hours after waking. The literature shows that this practice is common among children and adolescents and is associated with obesity.^{29,30} Thus, the students were encouraged to begin this practice, introducing, at least, some food considered healthy, such as bread, fruit, milk, salt biscuit, among others.

The "healthy eating" game was successful and the students played several rounds. Healthy eating cards helped to assimilate the contents of all previous classes.

In the last meeting, still on the topic "healthy eating," videos were used as a methodological strategy, which, in turn, grabbed the students' attention, who asked to repeat it several times, imitating the characters' speeches. The videos had food-shaped characters, and songs and trivia about the path traveled by food to the characters' tables.

The videos were carefully selected on the Internet, avoiding the use of misconceptions. In this way, it was possible to observe the availability of videos with information quality on the topic of nutrition. Boog et al.²⁷ used a video intending to problematize the topic "obesity" and reported a positive experience in the use of this type of instrument, as in the present study.

Thus, the games and playful activities were well accepted by the students. Besides the concepts of nutrition, it was possible to encourage their autonomy and creativity. Although the activities had been previously planned, the researchers were open to the students' suggestions in conducting the lesson and ludic activities, since it is necessary for the educator to recognize the importance of decentralizing teachers' roles, providing autonomy for the student, which encourages spontaneity and creativity in view of unexpected situations.^{31,32}

The games were prepared by researchers with mostly recyclable materials and easily replicated by the students. However, it is recognized that their preparation by the students themselves could favor their greater interaction with the topic proposed. This was not possible due to the need for longer time to complete the project and integration with other curricular subjects.

Through a formative evaluation, students' participation and interest regarding the topics and strategies used in EAN activities were observed. It is considered that the activity proposed has fulfilled its objective of providing knowledge about healthy eating, encouraging them to adopt healthy eating habits. It is emphasized that the permanent adoption of healthy eating habits is a complex and challenging task, in which a permanent and continuous teaching process is needed. Deminice et al.³³ have conducted an intervention study with students from the Brazilian city of Ribeirão Preto, SP, and observed an increase in the level of knowledge about healthy eating, concluding that short-term activities do not cause a significant effect on the students' nutritional status and food consumption, requiring long-term activities.

Activities that last a short time, as in the present study, already have positive effects on students' nutrition, which were observed by comparing the positive effect of the intervention before and after its accomplishment, using a questionnaire about the consumption of school lunch, foods offered by the school cafeteria, grocery stores near school and food brought from home. Thus, an increase in the weekly consumption of food brought from home to the school environment, an increase in the preference for fruits and fruit salad offered by school lunch and a reduction in the purchase of candies, lollipops and chewing gum in the school canteen were observed. These results are presented and discussed in the article by Prado et al.¹³

Conclusion

The results of this study are considered favorable, since the formative evaluation points to the students' understanding, interest, participation and positive reports about the activities proposed. However, it is believed that these activities make up a small beginning in learning about healthy eating, since effective and long-lasting activities must be continuously and permanently carried out from an early age.

It is noteworthy that the activities reported integrate some strategies that can be applied in school environments. In addition, it is possible to expand the topics chosen and include other teaching methods, such as cooking workshops, school vegetable gardening, parodies, among others.

Believing that the school environment is a suitable place for food and nutrition education activities, since it contains a group daily exposed to learning, it is recommended that these activities be integrated into the school curriculum and planned by a multi-professional team, including nutritionists. To this end, it is necessary to train teachers, school cooks, school leaders, school cafeteria owners and other school professionals in order to broaden these activities, as informal conversations and simple attitudes also constitute strategies for food and nutrition education.

It is hoped, therefore, that the present experience report will broaden the discussion about the strategies adopted in activities of food and nutrition education with students and the accomplishment of future activities.

Acknowledgments

To *Fundação de Amparo à Pesquisa do Estado de Mato Grosso* (FAPEMAT; Research Support Foundation of the Brazilian State of Mato Grosso) and Brazilian government *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* (CAPES; Coordination of Improvement of Higher Education), for the financial support.

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Received: April 24, 2015

Reviewed: October 12, 2015

Accepted: January 12, 2016