

## Development of an Activity Manual for Food and Nutrition Education for Children: An Extensionist Experience in Primary Health Care

*Desenvolvimento de um manual de atividades de educação alimentar e nutricional para crianças: uma experiência extensionista na Atenção Primária à Saúde*

*Elaboración de un manual de actividades de educación alimentaria y nutricional para niños: una experiencia de extensión en Atención Primaria de Salud*

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### Abstract

**Objective:** The objective of this study was to develop an educational technology manual to assist nutritionists and other health professionals in implementing Educação Alimentar e Nutricional (EAN, food and nutrition education) for children in the context of Primary Health Care. **Methods:** To prepare the manual, EAN activities previously developed and implemented by the team of the extension project “Oficina da saúde: Ações de Educação Alimentar e Nutricional Para Crianças na Atenção Primária à Saúde” (health workshop: food and nutrition education actions for children in primary health care) in a Municipal Health Unit in Belém, Pará were used. **Results:** The manual in its final form has 32 pages, presenting 10 EAN activities. **Final Considerations:** After preparing the manual, it was possible to highlight the relevance of this type of technology and its functionality as a simplifying manual for developing EAN actions, as well as the importance of debating the topics addressed for the empowerment and development of autonomy of children.

**Key words:** Food and Nutrition Education; Educational Technologies; Primary Health Care; Nutrition; Infant Nutrition.

### Resumo

**Objetivo:** O objetivo deste estudo foi elaborar uma Tecnologia Educativa do tipo manual, visando auxiliar os nutricionistas e demais profissionais da saúde no que diz respeito à aplicação da Educação Alimentar e Nutricional (EAN) para o público infantil no contexto da Atenção Primária à Saúde. **Métodos:** Para a confecção do manual, foram utilizadas atividades de EAN previamente elaboradas e aplicadas pela equipe do projeto de extensão “Oficina da saúde: Ações de Educação Alimentar e Nutricional Para Crianças na Atenção Primária à Saúde” em uma Unidade Municipal de Saúde de Belém, Pará. **Resultados:** O manual em sua forma final conta com 32 páginas onde são apresentadas 10 atividades de EAN. **Considerações Finais:** A partir da elaboração do manual, foi possível evidenciar a relevância desse tipo de tecnologia e sua funcionalidade como aparato simplificador para o desenvolvimento de ações de EAN, bem como a importância do debate sobre as temáticas abordadas para o empoderamento e desenvolvimento de autonomia do público infantil.

**Palavras-chave:** Educação Alimentar e Nutricional; Tecnologias Educativas; Atenção Primária à Saúde; Nutrição; Nutrição Infantil.

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**Study Design:** FNS, RMSCM, SMSF, MMLC

**Data collection:** FNS, RMSCM, SMSF, MMLC

**Data analysis:** FNS, RMSCM, SMSF, MMLC

**Manuscript writing:** FNS, RMSCM, SMSF, MMLC, ET.

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### Resumen

**Objetivo:** El objetivo de este estudio fue desarrollar una tecnología educativa de tipo manual, con el objetivo de ayudar a nutricionistas y otros profesionales de la salud en la aplicación de la Educación Alimentar e Nutricional (EAN, Educación Alimentaria y Nutricional) para niños en el contexto de la Atención Primaria de Salud. **Métodos:** Para la creación del manual se utilizaron actividades de EAN previamente desarrolladas y aplicadas por el equipo del proyecto de extensión “Oficina da saúde: Ações de Educação Alimentar e Nutricional Para Crianças na Atenção Primária à Saúde” (taller de salud: acciones de educación alimentaria y nutricional para niños en atención primaria de salud) en una Unidad Municipal de Salud de Belém, Pará. **Resultados:** El manual en su forma final tiene 32 páginas donde se presentan 10 actividades de la EAN. **Consideraciones finales:** De la elaboración del manual se pudo resaltar la relevancia de este tipo de tecnología y su funcionalidad como dispositivo simplificador para el desarrollo de acciones de EAN, así como la importancia del debate sobre los temas tratados para el empoderamiento y desarrollo de la autonomía de los niños.

**Palabras claves:** Educación Alimentaria y Nutricional; Tecnologías educativas; Atención Primaria de Salud; Nutrición; Nutrición Infantil.



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## Introduction

Socioeconomic changes over the past decades have directly impacted the nutritional and epidemiological profile of the Brazilian population. The lifestyle of modern society, where the convenience of processed and ultra-processed foods rich in sodium, sugars, and fats replaces healthy eating, is directly associated with the new global scenario of Non-Communicable Diseases (NCDs), emerging as a challenge for public health.<sup>1-4</sup>

With this nutritional transition, the rates of childhood overweight and obesity have been gaining prominence in the current post-pandemic epidemiological scenario. According to information from United Nations Brazil<sup>5</sup>, with data from the World Health Organization (WHO), it is estimated that the number of overweight children worldwide will reach 70 million by 2025. If current trends continue, childhood obesity will become an even more serious public health problem, with projections that it could increase drastically by 2030. Childhood obesity, in addition to harming physical and emotional development, may result in an increase in associated diseases, such as diabetes and heart problems.<sup>5-8</sup>

Such circumstances make it urgent to implement intersectoral actions focused on health promotion and addressing the social determinants of nutrition. Furthermore, the relevance of a health care model that prioritizes the promotion of adequate and healthy eating is emphasized, as established in the National Food and Nutrition Policy and the National Health Promotion Policy, with the objective of preventing and treating NCDs.<sup>1-3</sup>

Therefore, it is the responsibility of the Sistema Único de Saúde (SUS, Brazilian unified health system) to promote adequate and healthy eating through initiatives focused both on public policies and the reorientation of health services, which should integrate health promotion into daily activities.<sup>1,2</sup>

In this context, Primary Health Care (PHC) is responsible for conducting educational and counseling actions during individual or group consultations, based on the official guidelines for healthy eating present in the Food Guide for Brazilian Children Under Two Years of Age and the Food Guide for the Brazilian Population, whose implementation brings numerous benefits to the population's health.<sup>9</sup>

In this regard, EAN is highlighted as an indispensable tool within public food and nutrition policies. FNE is defined as a field of knowledge and continuous, permanent practice that is transdisciplinary, intersectoral, and multiprofessional. It aims to promote the autonomous and voluntary adoption of healthy eating habits through efficient educational and problem-solving strategies, which should be applied to users from the earliest age.<sup>10-12</sup>

FNE plays a fundamental role in shaping eating habits in children, considering that it is during this early stage of life that taste preferences are formed and the individual's

relationship with food is established. The variety and quality of foods introduced during this period are decisive for developing autonomy and food awareness in adulthood. In general, children encouraged from an early age to make healthy food choices tend to maintain these habits throughout their lives. Therefore, FNE proves to be highly efficient and critical in child development, contributing significantly to building a solid foundation of healthy eating practices and improving the quality of life of both the child and the future adult.<sup>13,14</sup>

However, the approach to EAN for children must be carried out in a specific manner, based on playfulness and dynamism. Moreover, it should also be closely connected to the act of playing, relying on accessible language and recreational, interactive tools as support materials.<sup>15</sup>

To support the work process of health professionals in services provided to the child population through EAN and achieve better results, the use of educational technologies for promoting nutrition in a healthy context is an important ally.<sup>16</sup>

Educational Technology (ET) is a tool for the socialization of knowledge that establishes a relationship between learning and practice through printed materials such as manuals, pamphlets, brochures, and booklets. Additionally, ET encompasses the implementation of workshops, games, and the use of technological devices such as tablets, cell phones, and computers. These resources become important educational tools in a process where children take on a leading role, expressing their own questions, doubts, myths, and truths in problem-solving situations.<sup>16</sup>

In the context of university extension programs, these technologies and methodologies are integrated to provide students with practical opportunities to apply the knowledge acquired at the university. This involvement in extension activities allows for the consolidation of learning and provides experiences that directly contribute to the training of students in their future professions, especially through serving the community.<sup>17</sup>

Recognizing the importance of extension programs in academic training reinforces the defense of the inseparability between teaching, research, and extension. This implies understanding that university knowledge goes beyond classes and spaces dedicated to acquiring scientific knowledge, also encompassing the transformative role of dialogue and interaction with the community in the development of students.<sup>18</sup>

Therefore, the present study aimed to report the experience of developing a manual to assist nutritionists and other health professionals in implementing EAN focused on children within the context of Primary Health Care. The initiative took into consideration the perceptions of the students and professors involved, as well as the participation of the users served by the extension project "Oficina da Saúde: Ações de Educação Alimentar e Nutricional para crianças na Atenção Primária à Saúde" (Health Workshop: Actions of Food and Nutrition Education

for Children in Primary Health Care), linked to the *Pró-Reitoria de Extensão* (PROEX, Extension Dean's Office) of the *Universidade Federal do Pará* (UFPA, Federal University of Pará). This experience was organized as part of a Graduation Thesis from the Nutrition Faculty.

## Methodology

This is an experience report on the development of an ET in the form of a manual to be used by professionals in EAN actions with children in Primary Health Care.

The material development process consisted of five stages: (1) Selection and organization of FNE activities; (2) Literature review on the topic; (3) Revision, study, and selection of information to compose the manual; (4) Organization of the structuring chapters of the ET; and (5) Manual design and final review.

Initially, all actions previously carried out by the team from the Extension Project of the Nutrition Faculty of the *Universidade Federal do Pará* (UFPA), entitled "Oficina da Saúde: Ações de Educação Alimentar e Nutricional para crianças na Atenção Primária à Saúde", were selected and organized. These activities targeted children aged two to seven years at the municipal health unit of Guamá in Belém, Pará, during the period from March 2019 to February 2020.

Next, a bibliographic survey was conducted. A total of 32 documents were selected, including 18 scientific articles (retrieved from the research platforms SciELO, LILACS, and PubMed, in Portuguese, English, and Spanish). The search for this material was carried out using the following descriptors: Food and Nutrition Education, Nutritional Education, Education; Health Education, Primary Health Care, Children, and Educational Technologies. Scientific publications from 2010 to 2020 were selected, excluding conference abstracts, as well as documents from the Ministry of Health and classic literary works, regardless of their year of publication.

From this stage, it was possible to gather all the content of interest for the educational manual, which was organized into six chapters. These chapters initially present a brief introduction to the thematic axes, followed by instructions for carrying out each EAN activity, including the objective, the materials used, and a description of each dynamic.

The systematization of the chapters was based on the themes addressed in each activity, grouping the dynamics according to the thematic axes. Therefore, the chapters were divided into:

1. Regional fruits: .....3 activities
2. Cardioprotective diet: .....1 activity
3. Non-communicable diseases: .....2 activities
4. Hygiene habits: .....1 activity
5. Food groups: .....2 activities
6. Nutritional deficiencies: .....1 activity

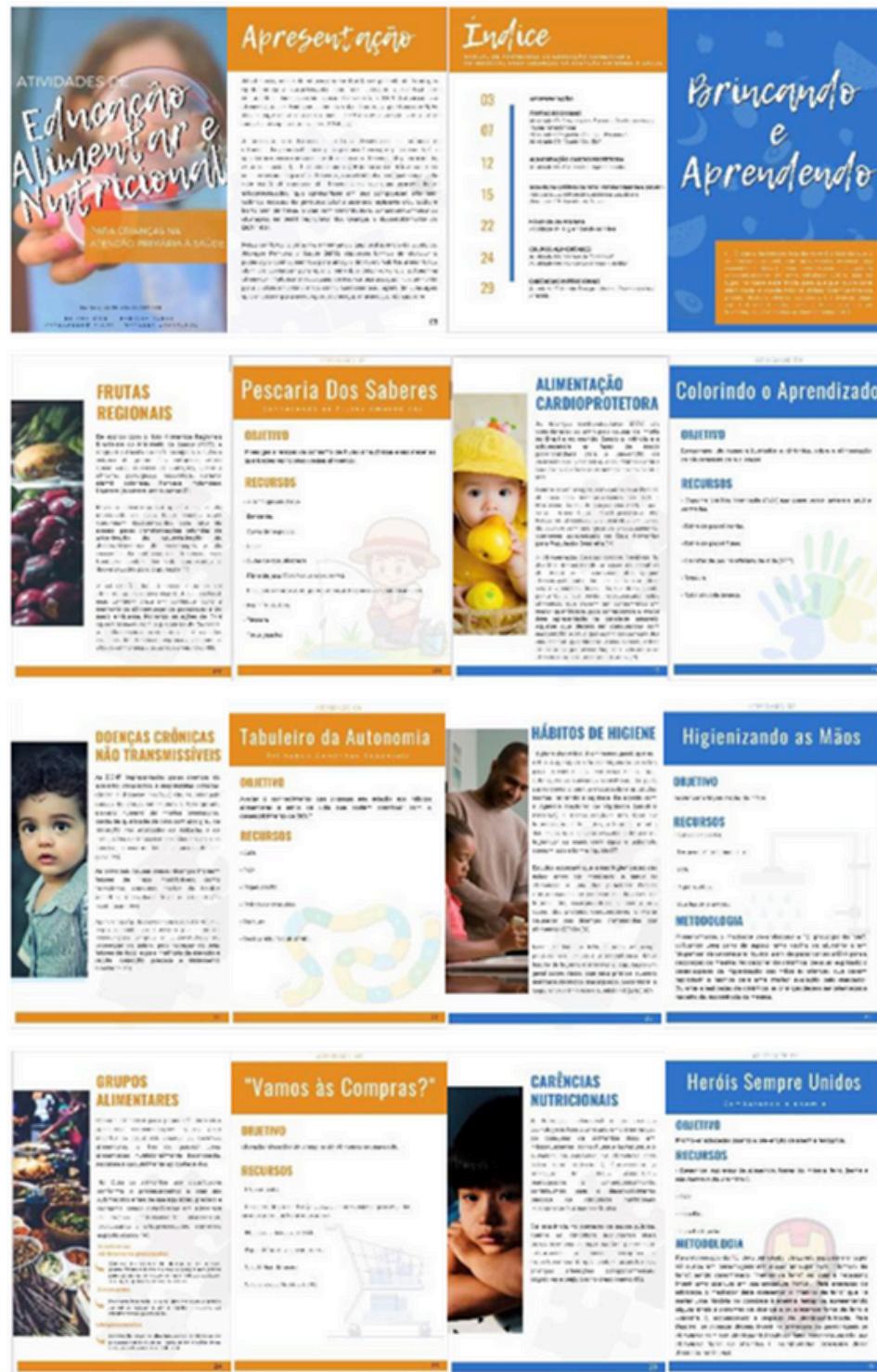
The manual was organized using the Canva® online business creation and management program, and its background design was created with the help of the CorelDRAW® graphic design software. The project formatting was carried out in dimensions of 148mm x 210mm, using the fonts Open Sans Light, Bebas Neue, Bebas Neue Cyrillic, and Arial in sizes 72, 51, 49, 42, 40, 36, 34, 27, 25, 20, 18, 16, 15, 14, 10, 9, and 8.6. The printing was done on A4-sized color paper.

The Extension Project was approved by the Research Ethics Committee on Human Subjects of the Instituto de Ciências da Saúde (ICS, Institute of Health Sciences) at UFPA, under protocol number 3.380.831. All participants had the Informed Consent Form signed by their respective guardians. This extension project received support from the PROEX/UFPA.

## Results and Discussion

With the objective of producing an ET capable of assisting professionals in FNE practices with children, especially in Primary Health Care, the presented manual was the final product developed from activities carried out in the extension project "Oficina da Saúde: Ações de Educação Alimentar e Nutricional Para Crianças na Atenção Primária à Saúde".

Figure 1 presents excerpts from pages of the manual, which was titled "Atividades de Educação Alimentar e Nutricional para crianças na Atenção primária à saúde" (food and nutrition education activities for children in primary health care).



**Figure 1** - Cover and pages of the manual "Atividades de Educação Alimentar e Nutricional para crianças na Atenção primária à saúde"

Source: Authors, 2025.

The manual was graphically designed with vibrant colors and text in an appropriate font size, aiming to capture the reader's attention and interest, making the educational material more attractive and engaging. Moreover, it consists of 32 pages, which present instructions for implementing FNE actions in a dynamic way, facilitating the reading and understanding of the material.

As for the content, the 10 dynamics that achieved the greatest success and coherence between results and proposed objectives during the project's activity period were presented. These activities address themes considered relevant for the development and health education of children, including knowledge about regional fruits, NCDs, cardioprotective diet, hygiene habits (personal and food hygiene), food group classification, and nutritional deficiencies

The first chapter consists of activities aimed at encouraging the consumption of typical fruits from the Northern Region (*bacuri, buriti, cupuaçu, pupunha, taperebá, tucumã, etc.*) by presenting some of their characteristics and properties. These fruits have unique textures and flavors and high nutritional value. Given their diversity, some are considered rich sources of vitamins, especially C and A, as well as minerals and organic substances, mainly antioxidants, which can help combat nutritional deficiencies in children.<sup>19,20</sup>

Despite being highly relevant to the cultural identity of the region, these foods are still little known, especially among children, due to changes brought about by globalization, the expansion of the food industry, and related factors. In this context, promoting the appreciation of regional foods from an early age, in addition to being a form of cultural expression, is also a strategy to improve the local population's nutrition.<sup>19</sup>

The second chapter focuses on cardioprotective nutrition. Regarding strategies for prevention and control of risk factors for the development of cardiovascular diseases, the Ministry of Health launched the cardioprotective nutrition guide in 2018. This document categorizes foods into colors based on their degree of processing.<sup>21</sup>

To establish this categorization, the colors of the national flag were used for segmentation, associating the predominance of each color in the flag with the recommended consumption prevalence of the foods they represent. Thus, green represents foods that should be consumed in greater quantities, yellow for those requiring moderation, and blue for those that should be consumed in smaller quantities. Additionally, the red group represents foods that should be avoided.

Therefore, this material shows great applicability as a basis for the development of EAN activities for children, due to its easy adaptation to playful dynamics.<sup>21</sup>

The activities that comprise the third chapter have the overarching goal of promoting healthy eating as a strategy for preventing NCDs, which currently represent the leading causes of death and loss of quality of life. At the same time,

they result in a high degree of limitations in work and leisure activities, as well as significant economic impacts at both individual and family levels and in public health sectors. This highlights the urgent need for changes in population lifestyle habits.

In this context, addressing this topic with children, considering that childhood is one of the phases with the greatest potential for preventing NCDs and developing healthy lifestyle habits, emerges as a broad and cost-effective health promotion measure.<sup>22,23</sup>

The diagnosis of a chronic illness during childhood can cause stress throughout the family dynamic, leading to changes and adaptations in the family's daily life. In certain cases, especially when children face prolonged treatments and frequent hospitalizations, significant emotional involvement is required from the moment of diagnosis to the complications and palliative care that may arise as the disease progresses.<sup>24</sup>

A study published in July 2024 by Silva et al.<sup>25</sup> analyzed the prevalence of chronic diseases in children and adolescents treated at a public reference hospital. The research revealed that 42.7% of participants had some form of chronic disease, with a higher incidence among males (55.2%). Welser et al.<sup>26</sup> observed that the incidence of elevated blood pressure levels in children and adolescents has been increasing, which is attributed to the high prevalence of overweight and obesity in this population. Excessive weight gain, especially when associated with increased visceral adiposity, is a significant cause of hypertension.

The fourth chapter emphasizes the importance of hygiene habits for both health and food quality. While it is generally known that personal and food hygiene is essential before and during meal preparation, the encouragement of this habit's development is often insufficient or even nonexistent. This contributes to the widespread transmission of foodborne illnesses such as salmonellosis, amebiasis, and worm infections.

In this context, promoting such practices from an early age is crucial for child development. It also highlights the importance of hygiene and raises awareness about the risks that inadequate hygiene practices can pose to Food and Nutritional Security (FNS).<sup>27,28</sup>

Chapter five addresses the food groups outlined in the "Guia Alimentar para a População Brasileira" (Food Guide for the Brazilian Population).<sup>2</sup> In this document, the classification of foods varies according to the level of processing they undergo before being made available to the population. The groups can be summarized as follows: fresh (in natura), minimally processed, processed, and ultra-processed foods.

It is worth noting that understanding this organization aids in fostering children's autonomy and is closely related to the principles of cardioprotective nutrition previously mentioned.<sup>1,29</sup>



Finally, the last chapter addresses nutritional deficiencies. This theme is fundamental for health promotion due to the increasing reduction in the consumption of foods rich in micronutrients, such as fruits and vegetables, coupled with the rise in the intake of foods with low nutritional value. The development of unhealthy eating habits with these characteristics is directly related to the early onset of nutritional disorders, among which iron-deficiency anemia and vitamin A deficiency stand out. These conditions result in behavioral / cognitive alterations and growth deficits and have significant prevalence among preschool-aged children. This highlights the need for FNE actions focused on preventing these conditions and directed towards children.<sup>30</sup>

Therefore, it is evident that the development of an ET serving as a facilitating tool for the transmission of information and techniques, such as the manual in question, is of paramount importance for strengthening FNE actions aimed at children. These activities, when addressing themes like those presented in this study, contribute to the process of developing children's autonomy, which is fundamental for promoting health and healthy eating, as well as preventing diseases related to food and nutrition.

Finally, it is important to highlight that the activities explained in the manual are easily accessible, low-cost, and can be applied in various locations, including different *Unidades Municipais de Saúde* (UMS, Municipal Health Units), clinics, schools, parks, etc., as long as there is an appropriate space for their development and a qualified professional to act as a facilitator, whether they are a nutritionist or not.

Additionally, such dynamics can be carried out in any region of Brazil, provided the content is adapted to suit local culture. Hence, this ET can be incorporated into public FNS facilities in the various territories where professionals in the field operate.

The importance of sharing the extension activities described here and ensuring quality academic training is also emphasized, enabling the integration of teaching and university extension programs. This integration aims to support the acquisition of knowledge, competencies, and skills.

## Final Remarks

The manual was designed to provide guidance to health professionals regarding FNE actions, gathering instructions for the execution of activities that had been previously carried out. Additionally, given the broad applicability of ET in PHC, the development of this work was significant for recognizing the importance of the manual as a tool capable of optimizing and enhancing FNE actions developed and implemented in PHC by health professionals.

Thus, the product presented in this work can be considered a valuable ET, created with the aim of assisting PHC professionals in planning educational activities in a simple and dynamic way. It also highlights the importance of university extension projects for improving the professional training of students during their undergraduate studies.

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