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DEVELOPMENT OF A METHOD FOR SELECTING THEMES IN FOOD AND NUTRITION EDUCATION ACTIONS FOR CHILDREN IN THE EARLY YEARS OF ELEMENTARY SCHOOL: A STRUCTURED PROPOSAL WITH A PRACTICAL EXAMPLE IN MUSIC

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ABSTRACT

Food and Nutrition Education (FNE) is an essential strategy for promoting healthy eating habits in childhood. The school stands out as a strategic space for the implementation of interventions in FNE, requiring structured methodologies that ensure effective and engaging approaches. This study aims to develop a systematic method for the selection of themes in FNE actions aimed at children in the early years of elementary school. The proposed method consists of five sequential steps: (1) Analysis of the Context and Local Needs, (2) Assessment of Cognitive and Sensory Development, (3) Definition of Educational Objectives and Curriculum Alignment, (4) Consultation with Stakeholders and (5) Prioritization and Final Selection of Themes. To demonstrate its applicability, the method was used in the creation of a musical educational resource entitled "Experimenting is Cool!", which encourages children to explore new foods through music. The structured selection process ensured that the chosen theme was relevant, pedagogically appropriate and aligned with the national guidelines for healthy eating. The study highlights the potential of music as a pedagogical tool in the EAN, favoring knowledge retention and promoting positive behavioral changes. Despite the contributions, limitations include the need for validation in different contexts and the expansion of the participation of children and families in the selection of themes. Future research should explore other interactive strategies and assess the long-term impact of music interventions on children's eating habits.

Keywords: Food and Nutrition Education. Infant Nutrition. Healthy Eating. Music. Early childhood education.

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INTRODUCTION

Food and Nutrition Education (FNE) is a fundamental field for the promotion of healthy eating and the prevention of chronic non-communicable diseases, playing an essential role in the formation of eating habits from childhood (Brasil, 2012; 2014). Studies indicate that eating behaviors acquired in the early years tend to consolidate in adolescence and adulthood, directly influencing the quality of diet and the incidence of chronic non-communicable diseases and conditions (FAO, 2020; Gato-Moreno *et al.,* 2021; Medeiros *et al.,* 2022; Murimi *et al.,* 2018; Varman *et al.,* 2021).

In this context, the school stands out as a strategic space for the implementation of FNE actions, as it enables continuous and systematic interventions, promoting learning and encouraging healthy food choices (Cotton *et al.,* 2020; Dollahite *et al.,* 2016; FAO, 2020). In addition, the EAN is incorporated into Brazilian public policies, such as the National Food and Nutrition Policy (PNAN), the Food Guide for the Brazilian Population, the National School Feeding Program (PNAE), among others, which reinforce the importance of educational strategies to encourage adequate eating habits from childhood.

For children in the early years of elementary school, the appropriate selection of themes for FNE actions is a central aspect for the effectiveness of interventions. Childhood is a critical period for the construction of food preferences, influenced by environmental, social, and cultural factors (Costa *et al.,* 2017). However, one of the challenges faced in the implementation of FNE programs is the definition of relevant and methodologically appropriate themes for this age group, ensuring that the educational approach is accessible and engaging (Murimi *et al.,* 2018; Peralta *et al.*, 2016; Tombini *et al.,* 2022; Weirich and Menti, 2022). Systematized methods ensure that the contents are aligned with the child's cognitive development, the current nutritional guidelines and the needs of the target audience. On the other hand, the absence of adequate planning can result in content that is disconnected from the students' reality and low effectiveness in changing eating habits (Murimi *et al.,* 2018; Tombini *et al.,* 2022; Varman *et al.*, 2021).

Among the pedagogical strategies applied to FNE, music has stood out as a playful and effective tool, facilitating knowledge retention and making learning more dynamic and interactive (Blasco-Magraner *et al.,* 2021; Dumont *et al.* 2017; Ogunsile, 2021). Educational songs help in the assimilation of nutritional concepts through melodies and rhymes, making the experience more engaging and participatory for children (Blasco-Magraner *et al.*, 2021; Dumont *et al.* 2017). Studies indicate that the use of music in

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nutrition teaching can enhance the memorization of information and stimulate positive changes in eating behavior, in addition to making the educational process more pleasurable and accessible (Ogunsile, 2021; Santos and Bergold, 2018).

In view of this scenario, this study has as its main objective the proposition of a systematic and replicable method for the selection of themes in FNE for children in the early years of elementary school. In addition, it seeks to exemplify the practical application of this method through the development of an educational song, demonstrating its viability as a pedagogical tool in children's food education. In this way, it is expected to contribute to the qualification of FNE actions and to the construction of healthier eating practices from childhood.

METHODOLOGY

This is a descriptive study of the Experience Report type to describe the methodological process for the selection of themes in Food and Nutrition Education actions aimed at children in the early years of elementary school, considering nutritional, educational, cognitive and cultural aspects.

The construction of the method was carried out by a multidisciplinary team composed of a professor from the Federal University of Acre with experience in food and nutrition education and music therapy, two students from the bachelor's degree in nutrition and a musician. The presence of professionals from different areas allowed for an interdisciplinary approach, ensuring that the selected topics were based on scientific evidence in nutrition, while respecting educational principles and playful strategies aimed at children.

The selection of themes followed a structured methodological process, based on the analysis of different educational models and successful experiences in the area of food and nutrition education.

To ensure compliance with national and international guidelines, the guidelines of the Reference Framework for Food and Nutrition Education for Public Policies (Brazil, 2012), the Food Guide for the Brazilian Population (Brazil, 2014) and the UN Sustainable Development Goals (UN, 2015) were considered, especially SDG 2 – Zero Hunger and Sustainable Agriculture, SDG 3 – Health and Well-Being and SDG 4 – Quality Education.

The method was developed in five sequential stages, ensuring its flexibility and replicability in different educational contexts (Chart 1).

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The first stage of the method consists of the analysis of the local context and needs, whose objective is to identify the nutritional and health profile of children, considering cultural and regional aspects. This analysis should include the collection of data on nutritional status, eating habits, socioeconomic influences and availability of healthy foods, allowing the themes to be aligned with the children's reality and addressing issues pertinent to their daily eating.

Then, in the assessment of cognitive and sensory development, the themes must be adapted to the children's developmental stage, considering their ability to understand and ways of learning. At this stage, resources such as accessible language, illustrations, interactive games, and sensory activities should be prioritized to facilitate learning and promote greater engagement. In addition, strategies should be devised that encourage food experimentation through taste, smell, touch, and sight, allowing children to actively interact with food and develop greater acceptance of new eating experiences.

The third stage consists of defining educational objectives and curriculum alignment, ensuring that the selected topics are in accordance with educational and health guidelines, such as the National School Feeding Program and the National Curriculum Parameters. At this stage, it is necessary to define clear learning objectives, ensuring that the content worked on contributes to the development of skills and knowledge applicable to children's daily lives. In addition, the integration of the themes with other school subjects is sought, favoring interdisciplinarity and enabling a broader approach to healthy eating within the school environment.

In the fourth stage, the consultation with stakeholders, the themes must be validated through a participatory analysis, involving teachers and health professionals, who assess the relevance, applicability and pedagogical adequacy of the proposed themes. This consultation allows adjustments and refinements in the thematic choices, considering the experience of the professionals involved in education and child health. However, it is noteworthy that in this first application of the method, the consultation was limited to teachers and health professionals, not directly including parents and children. It is recommended that, in future implementations, the consultation be expanded so that children can express their interests and suggestions, making the process even more representative.

The fifth and final stage consists of the prioritization and final selection of the themes, ensuring that the chosen themes are relevant, applicable to children's daily lives

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and organized progressively over time. Criteria such as impact on the formation of healthy habits, pedagogical feasibility and adequacy to the child context should be used. In addition, it is recommended to carry out pilot tests to evaluate children's engagement and the effectiveness of the selected content, allowing adjustments before the definitive implementation of educational actions.

Chart 1 – Stages of the Method for Selecting Themes in Food and Nutrition Education Actions.

Stage	Description
Analysis of the local context and needs	The nutritional and child health profile is identified, considering cultural and regional aspects. This analysis allows aligning the themes with the children's reality and addressing issues pertinent to their daily eating.
Assessment of cognitive and sensory development	The themes are adapted to the cognitive phase of the target audience, using accessible language, visual resources and practical activities. This stage includes sensory experiences that encourage active learning and engagement in children.
Definition of educational objectives and curriculum alignment	The themes are structured according to educational and health guidelines, such as the National School Feeding Program (PNAE), aiming at the promotion of significant and applicable knowledge.
Stakeholder consultation	The selection of themes is validated through consultation with parents, teachers and health professionals, ensuring their relevance. Children's feedback is also considered to identify content that arouses interest and motivation.
Prioritization and final selection criteria	The final selection prioritizes relevant and applicable themes to children's daily lives, considering an educational progression over time. Pilot tests can be carried out to evaluate the receptivity and effectiveness of the proposed themes.

Source: Authors, 2025.

RESULTS

The application of the method developed for the selection of themes in food and nutrition education actions resulted in the definition of five initial themes for the educational

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approach: healthy eating, according to the Food Guide for the Brazilian Population, healthy eating practices, hygiene and food safety, food and sustainability, and food and culture. These themes were organized based on the criteria established by the method, ensuring the adequacy to the children's needs, the educational relevance and the pedagogical feasibility of the approach.

To illustrate the application of the method and demonstrate its practical feasibility, an audiovisual practical example was developed, resulting in the production of a song and an educational video called "Experimenting is Cool!", whose composition and structure were planned based on the guidelines of the proposed method.

APPLICATION OF THE METHOD IN DEFINING THEMES FOR EDUCATIONAL MUSIC VIDEOS

The structured method for the selection of themes was applied in the definition of the contents to be worked on in educational audiovisual materials aimed at food and nutrition education. The choice of the song "Experimenting is Cool!" was based on the stage of analysis of the context and local needs, which indicated the importance of addressing children's willingness to try new foods, a recurring challenge in children's nutrition. This choice was in line with the principles of the Food Guide for the Brazilian Population, reinforcing the appreciation of real food and food diversity.

In addition, the music was structured considering the assessment of cognitive and sensory development, ensuring that the approach was accessible to children, promoting an active and playful learning experience. The song's structure was designed to stimulate curiosity and food acceptance, using musical elements that reinforce the main message that trying new foods can be fun and tasty.

SELECTION OF TOPICS BASED ON THE CRITERIA OF THE METHOD

The choice of the theme of the song "Experimenting is Cool!" followed the criteria defined in the study methodology, considering relevance, adequacy to cognitive development, connection with the curriculum and educational guidelines.

Relevance was one of the main factors for choosing the theme, as encouraging healthy eating habits from childhood contributes to the formation of more balanced eating patterns throughout life. The theme was selected based on the need to combat children's resistance to new flavors and textures.

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Adequacy to cognitive development was ensured by adapting the musical approach to the age group of the target audience. Simple rhymes, accessible language and an engaging melody were used to reinforce the educational message, favoring the memorization and engagement of children with the content.

The connection with the curriculum and educational guidelines was ensured through the alignment of the theme with the guidelines of the National School Feeding Program and the Food Guide for the Brazilian Population. The song emphasizes the importance of dietary diversity and encourages children to experiment with different types of foods, promoting autonomy and awareness about eating.

In addition, the positive reception by education and health professionals, after the public dissemination of the music, reinforced the effectiveness of the musical approach as an innovative and engaging strategy for food education. The use of music has shown potential to make learning more accessible, dynamic and pleasurable, facilitating the assimilation of concepts and encouraging children to adopt healthier eating habits in a natural and playful way.

REPORT OF THE PROCESS OF DEVELOPMENT OF THE SONG AND VIDEO

The process of developing the music and the educational video followed the guidelines of the proposed method, ensuring that the contents were aligned with the needs of the child audience and the principles of food and nutrition education. The song "Experimenting is Cool!" was created to address one of the most common challenges in infant feeding: resistance to new foods. The composition was designed to convey a positive and motivating message, encouraging children to try different types of food without fear or rejection (Chart 2).

The construction of the song's lyrics was based on a playful and engaging approach, using simple rhymes and a repetitive structure to facilitate memorization. The melody was composed with musical elements that stimulate children's attention and engagement, ensuring that the learning experience was pleasurable and interactive. The lyrics reinforce the idea that trying new flavors can be fun and that tastes can change over time, encouraging food curiosity without imposition.

The musical production involved the choice of instruments and arrangements suitable for children, prioritizing cheerful and dynamic sounds that would create an inviting atmosphere for the active participation of children. The song was recorded with expressive

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vocals and harmonies that reinforce the positive energy of the message. During this process, tests were carried out to assess the reception of the song by the target audience, ensuring that the language and rhythm were appropriate for the intended age group.

Chart 2 – Lyrics of the Song 'Experimenting is Cool!'.

Experimenting is Cool! Author: Alanderson A. Ramalho Verse 1: *Look at the dish, there's something new here, A different fruit, what a good smell I felt! Is it sweet? Is it sour? There's only one way to know: by taking a bite!* Pre-Chorus: *If I never taste it, how will I know? Each flavor has a world to know!* Chorus: *Experimenting is cool, come with me, come try! Each new food has a taste to love! It can be sweet, it can be crunchy, Every little piece makes us interesting!* Verse 2: *There's the green kiwi and the purple açaí, There's orange carrot, and the yellow corn there! If I never taste it, how will I know? What I like or dislike, I can only say... trying to eat!* Bridge: *Hey, how about a challenge? Today you choose a new food to try! It can be a fruit, a vegetable or a grain, Who knows, maybe it will become your favorite then?*

After the completion of the song, the development of the educational video began, which aimed to complement the message of the song through attractive visuals and interactive narratives. The creation of the script was based on the structure of the music, ensuring coherence between the sound content and the animation. Scenes that represent children's everyday situations were explored, such as mealtime, the discovery of new foods and interaction with family and friends during feeding (Figure 1).

The video was produced with colorful illustrations and captivating characters, creating a visual environment that piques children's interest and reinforces the emotional connection with the theme. The characters were developed in an expressive way and

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animated to demonstrate reactions of curiosity and surprise when trying new foods, reinforcing the central message of the song. In addition, visual elements that highlight the food variety were used, such as the presentation of different fruits, vegetables and healthy preparations in a vibrant and attractive way.

The final video editing incorporated smooth transitions, sound effects, and precise synchronization with the music to maintain the fluidity of the audiovisual experience. The combination of visual and sound elements was planned to maximize children's understanding and retention of the message. The video is available on *YouTube* and can be accessed at: https://youtu.be/xGpk7_QODsk?si=OYZrbjCHKSLQirRx .

Figure 1 - Screenshot of the video "Trying is Cool!"

Source: Authors, 2025.

DISCUSSION

The selection of topics in Food and Nutrition Education (FNE) is usually based on participatory diagnoses and official guidelines (Brasil, 2012). A common approach is to conduct a survey of the needs of the target audience – for example, questionnaires or conversation circles with children, parents or educators – to identify which topics are most relevant or what doubts and difficulties exist (Dollahite *et al.,* 2016). This diagnosis situates the choice of content in the reality of the group, aligning itself with the Freirean method of "generating themes". In a Brazilian project, for example, educators applied questionnaires before the interventions and identified topics such as childhood obesity, food hygiene, foodborne diseases, and consumption of processed foods, among others, as priorities

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(Santos and Bergold, 2018). Similarly, in a teacher training, the "demand" phase identified difficulties, expectations and main themes that should be addressed; the next stage of pre-analysis confirmed generating themes such as "healthy eating, healthy meal options, promotion of healthy habits in the community, current context of food, legal aspects at school and full use of food" (Bernardon *et al.,* 2009). These examples illustrate participatory methodologies in which the needs and interests of the school community direct the selection of FNE themes.

Another important criterion is alignment with current dietary guidelines and health/nutrition policies. National dietary guidelines offer valuable clues on key issues that deserve special emphasis in educational programmes (FAO, 2005; 2020; Brazil, 2014). For example, if a country's food guide highlights fruit and vegetable consumption or sugar moderation, these recommendations guide the choice of topics (e.g., "everyday vegetables" or "soft drinks and sugar"). Thus, educators ensure scientific and cultural coherence, addressing content appropriate to the age group and the local context. Structured curriculum models in EAN often organize topics by axes (such as food groups, hygiene, sustainability, food culture, etc.), but recommend flexibility to adapt to the students' reality.

Several comparative studies indicate that playful and interactive strategies tend to surpass traditional (expository) methods in terms of engagement and learning in children's nutrition education. Traditional approaches – such as lectures, pamphlets, or lectures – can impart knowledge, but they often position the child as a passive receiver. Playful approaches (play, games, practical workshops, stories, theater, music, gardening, etc.) actively involve students, making learning more fun and effective (Jarpe-Ratner *et al.,* 2016; Parmer *et al.*, 2009; Hersch *et al.,* 2014; Dudley *et al.,* 2015; Savoie-Roskos *et al.,* 2017) A large systematic review demonstrated that experiential activities – e.g. educational games, school gardens, cooking workshops, guided tastings, and role-plays – significantly improve children's knowledge, attitudes, and eating behaviors, compared to interventions without these playful elements (Varman *et al.,* 2021). Such practical activities have shown effectiveness both in preschoolers (improving acceptance of new foods, sensory learning) and in elementary school children (Varman *et al.*, 2021). The results suggest that engaging students in "learning by doing" (planting, cooking, playing) promotes greater understanding and retention of healthy eating concepts than just hearing or reading about them.

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A systematic review with meta-analysis in school nutrition education corroborated this advantage of active methodologies. When evaluating 49 interventions, the meta-analysis found more robust effects on all outcomes (such as increased fruit/vegetable consumption and improved knowledge) when the teaching strategy included experiential/play components, rather than just traditional education (Dudley *et al.,* 2015). Educational games show particular potential to motivate children: by competing in a healthy way, solving challenges or interacting with stories, students internalize nutritional messages almost "without realizing it", through fun. Evidence shows that playful methods not only increase immediate engagement and interest, but can also lead to more lasting changes in habits. In contrast, exclusively traditional methods run the risk of becoming monotonous, having a more limited impact on behaviors. A narrative review on preschoolers highlighted that the most used and appropriate instruments for children's cognition include children's stories, games (traditional or digital) and illustrated food guides, concluding that these resources provide "playful and meaningful moments of learning" and should be explored by educators (Braga-Pontes *et al.,* 2020).

The use of music and songs emerges as a promising playful strategy in the food education of children, with studies showing benefits in learning and involvement. Music acts as a multisensory resource, where rhythm, melody, and lyrics facilitate the memorization of concepts and make the experience pleasurable (Blasco-Magraner *et al.,* 2021; Kostilainen *et al.*, 2024; Dumont *et al.*, 2017). Recent research has formally evaluated the impact of inserting educational songs on healthy eating into FNE programs (Ogunsile, 2021; Pontes and Araújo, 2019; Santos and Bergold, 2018). In a quasi-experimental study with adolescents, one group received conventional nutrition classes plus "healthy eating songs", while another control group received only conventional instruction. Both groups improved their knowledge, attitude, and eating practices after the intervention, but the group exposed to music showed significantly greater gains in all of these aspects (Ogunsile, 2021). In other words, students who learned through songs demonstrated more positive understanding and behaviors than those who did not have this musical reinforcement. The authors concluded that integrating thematic songs into teaching can be an effective means of improving educational outcomes in nutrition, recommending cultural adaptations of songs for different audiences (Ogunsile, 2021).

In the context of early childhood and elementary school, there are several case reports and practical experiences underlining the effectiveness of music as a pedagogical

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tool (Blasco-Magraner *et al.,* 2021; Kostilainen *et al.,* 2024; Dumont *et al.,* 2017). University extension projects in Brazil have used musical workshops to address healthy eating with children. In an experiment described between 2014–2016, educators conducted "musical workshops" in a public school, with students aged 5 to 15 years, addressing FNE topics (such as obesity, hygiene, and industrialized food) through playful activities that included music and parody composition (Santos and Bergold, 2018). Each session ended with the children creating a musical parody of what they had learned, reinforcing the concepts in a creative way. The report indicates that such musical activities generated great engagement: the children actively participated and, in the end, were able to compose and sing the parodies suggesting understanding of the contents (Santos and Bergold, 2018). Another report with preschoolers involved a dramatization with characters and the adaptation of popular songs in parodies about healthy eating; it was observed that the children watched attentively, interacted enthusiastically and assimilated the lyrics of the songs very easily, singing along and showing interest in the theme (Pontes and Araújo, 2019). These qualitative examples reinforce that music makes the learning environment lighter, more fun and memorable for children. Educational songs – whether composed especially about food groups, vitamins, or adapted from well-known melodies with lyrics about eating well – serve as effective mnemonics.

The implementation of structured FNE methods – for example, programs with a defined curriculum, didactic material, and standardized methodology – requires adaptations according to the context in which they occur, whether the formal school environment or informal community spaces (Silva Rego *et al.,* 2022; FAO, 2020; Florintino *et al.,* 2023). Formal educational contexts, such as schools, offer structure and a captive audience, but they present their own challenges: fixed schedules, a curriculum already loaded with content, and the need to align with educational guidelines. Community contexts (such as projects in community centers, NGOs, health units, or groups in communities) provide more flexibility and cultural proximity, but face issues such as voluntary public adherence, limited resources, and heterogeneity of participants. Studies highlight that, for structured methods to be effective in any of these scenarios, it is essential to consider local specificities and involve the actors of the context. Successful interventions are usually multicomponent and collaborative, involving school, family and community (FAO, 2020; Florintino *et al.,* 2023; Inácio *et al.,* 2022;).

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In schools, the literature points to both the potential and the obstacles to implementing structured EAN programs. On the one hand, school programs led by trained teachers can significantly improve students' nutritional knowledge and even diet indicators. On the other hand, research also records many practical obstacles reported by teachers and principals, which hinder or limit the execution of FNE activities in everyday school life (Cotton *et al.,* 2020; Murimi *et al.,* 2018; Peralta *et al.,* 2016). Among the most cited challenges are the lack of time in the curriculum (nutrition ends up being passed over because it does not fall into standardized tests), scarcity of didactic and support resources (materials and training) and absence of specific training of teachers (Dudley *et al.,* 2015; Porter *et al.,* 2018; Vlieger *et al.,* 2019). Teachers at the initial levels often do not receive sufficient preparation in nutrition education during their training (Dudley *et al.,* 2015), and often lack the confidence or motivation to teach these topics. In addition, implementing structured methods requires continuity and monitoring, which can come up against changes in teachers or different priorities of the school. A recent review summarized these points, pointing out that school EAN faces barriers such as: content outside formal assessments, teachers without expertise or training in nutrition, and few opportunities for continuing education in this area (Cotton *et al.,* 2020). As a way out, some schools have sought partnerships with external professionals (health program nutritionists, university students, NGOs) to conduct FNE classes (Porter *et al.,* 2018). This intersectoral articulation, although positive for bringing specialists, has the counterpoint of taking away from the regular teacher the role of health agent, when the ideal is to integrate him into the process. In other words, in school contexts, the applicability of structured programs depends on institutional support (inclusion in the school's pedagogical project, support from the principal), training and resources for educators, and strategies to involve other sectors (health, agriculture, etc.) without losing the engagement of the school community.

In community contexts, structured methods must also be flexible and culturally adapted. A planned school intervention may need adjustments when taken, for example, to a rural or urban community center. Common challenges in communities include: difficulty in maintaining participant attendance (due to volunteering), varying levels of literacy and prior knowledge, and infrastructure limitations (space, utensils, food for workshops). On the other hand, the community offers opportunities such as greater involvement of families, freedom to address emerging themes of local interest and the possibility of integrating traditional knowledge. Studies in community nutrition show that it is crucial to work with

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local leaders and families, and to respect cultural food practices, so that the method has applicability and impact (FAO, 2005; 2020). Intersectoriality is pointed out as key in both contexts: actions that connect schools, health services, social assistance, and local organizations tend to be more successful (Bezerra, 2018; Brazil, 2012). For example, a structured FNE program can achieve better results if it involves community health workers or local religious leaders spreading the messages, adapting the language, and reinforcing the lessons outside the formal space. In summary, the application of structured methods in different scenarios requires contextual adaptation (the "same" FNE booklet can be applied in different ways in an urban school versus a rural community project), as well as collaboration between education professionals, nutritionists and community members. When these challenges are addressed – with adequate training, appropriate materials and multi-institutional support – the chances of success increase, enabling structured FNE to transform habits in both the school and community environments.

The implementation of FNE programs aimed at children faces several documented difficulties, but the literature also offers strategies to optimize these actions. Among the recurring obstacles is the low prioritization of nutrition education in the school context – often seen as an extra or transversal activity, with no time dedicated to the workload (Vlieger *et al.,* 2019). This is related to the pressure for content evaluated in exams, causing health topics to take a back seat. In addition, there is insufficient training of teachers and educators to work with EAN. Many professionals report not feeling prepared to teach nutrition in an attractive way, either due to lack of technical knowledge or lack of adequate pedagogical methodologies (Dudley *et al.,* 2015). The absence of pedagogical support and continued training in FNE limits the quality of interventions. Another difficulty is the scarcity of didactic and structural resources: schools and communities may not have illustrative material, food for demonstrations, experimental kitchens or even appropriate spaces for practical activities, which restricts the playful part. Cultural and behavioral resistance is also a challenge – for example, children (and families) who are very accustomed to ultra-processed foods may resist change, requiring a greater effort to convince and negotiate. Involving parents and guardians is notoriously difficult but crucial; studies highlight that without family engagement, the gains obtained at school may not be consolidated at home (Tombini *et al.,* 2022). Going beyond the "school walls" and influencing the family and community environment is, therefore, a central challenge in the implementation of children's FNE. Finally, there are policy and management issues: many

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initiatives lack institutional support and continuity. Successful pilot projects sometimes fail to sustain themselves due to lack of funding, change of managers, or insufficient public policies (FAO, 2020).

In view of these obstacles, research and experiences suggest several proposals to optimize children's FNE. An almost unanimous recommendation is to invest in training and qualification – both for teachers and nutritionists and other agents – in order to prepare them to act in an integrated way. In-service training, pedagogical support materials, and a greater presence of FNE content in the initial training of educators can increase confidence and competence to implement actions (Dudley *et al.,* 2015; Vlieger *et al.,* 2019). Another proposal is to integrate the EAN into the formal school curriculum, either via Science/Biology subjects or interdisciplinary projects, instead of treating it only as an occasional event. Institutionalization through policies (for example, laws that mandatorily include healthy eating topics in pedagogical plans) helps to guarantee time and resources for these activities. Several studies emphasize the importance of involving families and the community as an optimization strategy (Capper *et al.,* 2022; Gato-Moreno *et al.,* 2021; Medeiros *et al.,* 2022; Murimi *et al.,* 2018; Vlieger *et al.*, 2019). This can be done through meetings, cooking workshops with parents, sending informational materials home, or even educational sessions open to the community. When parents participate in face-to-face sessions and understand the key messages, the effectiveness of interventions with children increases significantly (Murimi *et al.,* 2018). The adoption of long-term multicomponent interventions is also recommended: instead of one-off actions, programs of at least 6 months, with multiple strategies (classes, practices, improvements in the school's food environment, vegetable gardens, healthy canteens, etc.), tend to achieve more robust results (Medeiros *et al.,* 2022; Murimi *et al.,* 2018). Ensuring the fidelity and quality of actions is another point – this includes developing consistent plans with clear objectives and monitoring execution, for example, through training of implementers and use of standardized materials (Cotton *et al.,* 2020; Murimi *et al.,* 2018). In the context of cultural difficulties, playful and participatory strategies (such as games, music, theater, tastings) are proposed precisely to break resistance and increase children's engagement, making learning fun and relevant, as previously discussed. In addition, creating spaces for intersectoral dialogue – educators, nutritionists, school managers, health professionals – favors the exchange of knowledge and mutual support, minimizing the isolation of those who run the project (Tombini *et al.,* 2022). For example, the coordination between the

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pedagogical team and the school feeding team (lunch cooks, PNAE nutritionists) can align the theory seen in the classroom with the practice of the cafeteria, enhancing results. In summary, proposals to optimize children's FNE involve: strengthening institutional capacities (training, curriculum, resources), stimulating family/community participation, adopting interactive and long-term approaches, and ensuring political and managerial support for the initiatives to be sustained. When these recommendations are put into practice – as pointed out by several reviews and case studies – greater success is observed in implementation, with FNE programs that are more effective in promoting healthy eating habits in children (Cotton *et al.,* 2020; Murimi *et al.,* 2018; Tombini *et al.,* 2022).

This study presented a structured methodology for the selection of themes in FNE, ensuring alignment with dietary guidelines, adaptation to child cognitive development and stakeholder participation, which increases the relevance of educational content. In addition, it highlights the use of music as a pedagogical tool, favoring the retention of knowledge and the engagement of children. The participatory approach, involving teachers, family members and children, strengthens the applicability of the method and its acceptance in the educational context. Finally, the flexibility of the methodology allows its replication and adaptation to different audiences, age groups, and sociocultural realities, expanding its impact on the promotion of healthy eating habits.

Despite its contributions, the study has some limitations, such as the absence of a large-scale validation of the method, which prevents the immediate generalization of the results. In addition, the consultation with stakeholders was restricted to teachers and health professionals, without the direct inclusion of children and their families in the decision-making process, which could further enrich the selection of themes. The applicability of the method may also vary according to the resources available in educational institutions, and may require adaptations for different contexts. Finally, the impact of the musical approach on the retention of knowledge and the modification of eating behaviors still requires further investigation to prove its long-term effectiveness.

CONCLUSION

This study proposed a structured method for the selection of themes in Food and Nutrition Education aimed at children in the early years of elementary school, aiming to promote healthy eating habits more effectively. The practical application of the

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methodology was illustrated by the creation of the song and the educational video "Experimenting is Cool!", highlighting the feasibility of playful approaches in nutritional education. The positive reception of the content indicates that the combination of music and audiovisual resources can be an effective strategy to engage children and encourage food experimentation.

The developed method is based on five main steps: analysis of the context and needs of the public, cognitive and sensory assessment, definition of educational objectives, consultation with stakeholders and criteria for prioritizing the themes. This structure allows for the alignment of EAN's actions with the guidelines of the Food Guide for the Brazilian Population and with the particularities of child development. In addition, it has potential for application in schools, NGOs, extension projects and public policies, and can be adapted to different educational and community realities.

However, the study has limitations, such as the need for validation in different contexts and audiences, in addition to the restriction of consultation with stakeholders and teachers and health professionals, without the direct participation of children and families. Future research should explore other pedagogical strategies, such as interactive games and augmented reality, and evaluate the impacts of the method on long-term modification of eating behaviors.

Thus, this study represents an advance in the systematization of the choice of themes in children's FNE, reinforcing the importance of evidence-based approaches adapted to the target audience. By combining methodological rigor and creativity, the proposal contributes to the promotion of healthy eating habits in childhood and to the construction of a more conscious and sustainable food system.

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