JURNAL SIPAKATAU
INOVASI PENGABDIAN MASYARAKAT

E-ISSN: 3031-5905
E-ISSN: 3031-5972
Volume 2 Nomor 5, Agustus 2025

Healthy Kids Program Improving Children's Nutritional Awareness Through Interactive Learning

Program Anak Sehat Meningkatkan Kesadaran Gizi Anak Melalui Pembelajaran Interaktif

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ARTICLE INFO

Article History
Received: June 12, 2025
Accepted: July 25, 2025
Published: August 03, 2025

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DOI:https://doi.org/10.61220/sipakatau

ABSTRACT

Malnutrition and low nutrition literacy among school-aged children remain significant public health challenges in Indonesia, including in Rangkasbitung, Banten. This community service initiative, the Healthy Kids Program: Improving Children's Nutritional Awareness Through Interactive Learning, aimed to enhance children's understanding of balanced nutrition and foster healthy eating behaviors through engaging, interactive methods. The program employed educational games, simulations, and discussions to encourage active participation, complemented by the involvement of parents and teachers to reinforce learning outcomes at home and in the school environment. A pre-test and post-test were conducted to measure changes in children's knowledge, with results indicating a substantial increase in understanding of balanced nutrition and healthy food choices, rising from an average of 47% to 83%. Additionally, the program provided educational materials to schools, supporting the sustainability of nutrition education initiatives in the community. The findings align with evidence highlighting the effectiveness of interactive and community-based approaches in improving nutrition literacy and promoting healthy dietary practices among children. By building local capacity and aligning with public health goals, the Healthy Kids Program demonstrates its potential as a scalable and replicable model for addressing malnutrition challenges in similar contexts. This initiative underscores the importance of integrating interactive learning with family and community engagement to support the development of healthy lifestyles among school-aged children, contributing to broader efforts to achieve Sustainable Development Goals related to child health and education.
Keywords: *healthy kids program, children's nutritional, interactive learning*

ABSTRAK

Malnutrisi dan rendahnya literasi gizi pada anak usia sekolah masih menjadi tantangan kesehatan masyarakat yang signifikan di Indonesia, termasuk di Rangkasbitung, Banten. Inisiatif pengabdian masyarakat ini, Program Anak Sehat: Meningkatkan Kesadaran Gizi Anak Melalui Pembelajaran Interaktif, bertujuan untuk meningkatkan pemahaman anak-anak tentang gizi seimbang dan menumbuhkan perilaku makan sehat melalui metode yang menarik dan interaktif. Program ini menggunakan permainan edukatif, simulasi, dan diskusi untuk mendorong partisipasi aktif, dilengkapi dengan keterlibatan orang tua dan guru untuk memperkuat hasil belajar di rumah dan di lingkungan sekolah. Tes pra dan tes pasca dilakukan untuk mengukur perubahan pengetahuan anak-anak, dengan hasil yang menunjukkan peningkatan substansial dalam pemahaman tentang gizi seimbang dan pilihan makanan sehat, meningkat dari rata-rata 47% menjadi 83%. Selain itu, program ini menyediakan materi edukasi ke sekolah-sekolah, mendukung keberlanjutan inisiatif edukasi gizi di masyarakat. Temuan ini sejalan dengan bukti yang menyoroti efektivitas pendekatan interaktif dan berbasis komunitas dalam meningkatkan literasi gizi dan mempromosikan praktik pola makan sehat pada anak-anak. Dengan membangun kapasitas lokal dan menyelaraskannya dengan tujuan kesehatan masyarakat, Program Anak Sehat menunjukkan potensinya sebagai model yang terukur dan dapat direplikasi untuk mengatasi tantangan malnutrisi dalam konteks serupa. Inisiatif ini menggarisbawahi pentingnya mengintegrasikan pembelajaran interaktif dengan

keterlibatan keluarga dan masyarakat untuk mendukung pengembangan gaya hidup sehat pada anak usia sekolah, yang berkontribusi pada upaya yang lebih luas untuk mencapai Tujuan Pembangunan Berkelanjutan terkait kesehatan dan pendidikan anak.
Kata Kunci: program anak sehat, nutrisi anak, pembelajaran interaktif

1. INTRODUCTION

Nutritional issues among school-age children remain a significant concern in Indonesia, including in the Banten region. Data from the National Health Survey (Riskesdas) shows that the prevalence of stunting and undernutrition among school children is still relatively high, affecting their health quality and academic performance (Kemenkes RI, 2018). School-age children are in a critical phase for developing eating habits and nutritional awareness, as they begin to make independent food choices and establish dietary behaviors that may persist into adulthood (Gibbs et al., 2020). However, studies indicate that nutrition literacy among school children in Indonesia remains low, particularly in understanding balanced diets and making nutritious food choices (Utami et al., 2021). This low awareness leads children to frequently choose foods high in sugar, salt, and fat, increasing the risk of obesity and micronutrient deficiencies (Wang et al., 2019). This condition highlights the need for age-appropriate nutrition education interventions to help children understand the importance of proper nutritional intake in supporting optimal growth and development.

Banten, as a developing province, faces challenges in fulfilling the nutritional needs of school-age children, especially in areas with limited access to health information and education. In Lebak Regency, particularly Rangkasbitung District, there are still school children experiencing undernutrition and lacking an understanding of balanced nutrition concepts (Dinas Kesehatan Banten, 2023). Studies in similar regions have shown that limited access to nutrition information and parents' skills in providing nutritious food are among the factors contributing to the low quality of children's dietary consumption (Mahmudiono et al., 2022). Therefore, implementing nutrition education interventions with interactive approaches can be an effective strategy to enhance children's awareness and knowledge regarding the importance of healthy eating patterns (Moreno et al., 2017). This also aligns with the Sustainable Development Goals (SDGs), particularly Goal 2 on ending hunger and malnutrition, which remains a challenge in developing regions in Indonesia (UNICEF, 2022).

Nutrition education interventions for school-age children have proven effective when conducted using interactive approaches, such as educational games, healthy eating simulations, and group discussions, making it easier for children to understand the materials and become interested in practicing them (Wiggins et al., 2021). Conventional one-way lecture methods are considered less effective in increasing children's nutritional awareness and understanding (Kurniawan et al., 2023). Interactive learning methods help children internalize information, enhance learning motivation, and develop decision-making skills related to food choices (Fariza et al., 2022). Thus, implementing the Healthy Kids Program with an emphasis on interactive learning at elementary schools in Rangkasbitung will help address the knowledge and practice gaps in children's nutrition while providing long-term impacts on improving children's health status.

Improving children's nutritional awareness through interactive programs also requires the involvement of teachers and parents as agents of nutritional behavior change among children (Abdulai et al., 2019). Active participation of teachers in the education process helps ensure the program's sustainability and the integration of nutrition materials into school teaching and learning activities (Simatupang et al., 2021). Meanwhile, parental involvement in guiding children to adopt healthy eating patterns at home can strengthen the results of nutrition education received at school, creating a supportive environment for the implementation of balanced diets (Khairunnisa et al., 2020). Synergy between schools and parents in nutrition education is a crucial element in ensuring the success of interactive nutrition education programs implemented through community service.

Given these conditions, the Healthy Kids Program: Improving Children's Nutritional Awareness Through Interactive Learning is designed to help children in Rangkasbitung District gain understanding and awareness of the importance of consuming nutritious foods through interactive methods. This program will utilize educational games, healthy eating simulations, and group discussions to help children understand the concept of balanced nutrition in a fun and practical way. Through this program, it is expected that there will be an increase in children's understanding and awareness of the importance of nutrition in daily life while contributing to reducing malnutrition rates among school-age children in the area. This activity will also serve as a means for academics to support the national health program targets related to reducing stunting and malnutrition rates among children.

Child nutrition education programs are not only intended to increase children's knowledge but also to encourage changes in attitudes and practices regarding food consumption and healthy lifestyles. Studies have shown that children who receive structured nutrition education tend to adopt healthier dietary patterns, including increasing the consumption of fruits and vegetables while reducing the intake of sugary and high-fat foods (Contento et al., 2020). Additionally, interactive nutrition education has been found to enhance children's motivation to practice healthy behaviors and develop self-efficacy in making food choices that align with balanced

nutrition guidelines (Birch & Savage, 2016). Collaborative learning activities, such as role-playing and food preparation demonstrations, can also strengthen children's cognitive and psychomotor skills related to nutrition, making them more confident in choosing and consuming healthy foods (Perez-Rodrigo & Aranceta, 2017). In addition, a systematic review conducted by Duncanson et al. (2021) highlighted that community-based nutrition education programs in schools contribute significantly to reducing the prevalence of childhood obesity and malnutrition, especially in developing countries with limited health literacy. Therefore, the implementation of interactive nutrition education through the Healthy Kids Program in Rangkasbitung is expected to have a substantial impact on improving children's nutritional awareness and behavior, supporting their health status for optimal growth and academic achievement.

The success of nutrition education programs for school-age children also depends on the contextualization of educational materials according to local culture and the children's daily environment. In the case of Rangkasbitung, children's eating habits are often influenced by family conditions, local food availability, and socio-economic status, which sometimes limit access to a variety of nutritious foods (Mahmudiono et al., 2022). Therefore, the Healthy Kids Program will adapt its educational content to local food sources and practices, enabling children to apply the knowledge gained to their daily lives without significant barriers. Interactive methods such as food simulations and games using locally available food examples are expected to increase children's interest and understanding of balanced nutrition concepts (Fariza et al., 2022; Wiggins et al., 2021). This approach aligns with the recommendation that nutrition education should consider local contexts to increase its effectiveness in improving children's dietary behavior (Moreno et al., 2017).

Moreover, the involvement of teachers and parents in the implementation of the Healthy Kids Program is crucial to ensure the sustainability of the knowledge and practices taught to children. Teachers serve as facilitators who can integrate nutrition education into the learning curriculum and reinforce positive behaviors in daily school activities (Simatupang et al., 2021). Parental support at home, such as preparing healthy lunch boxes and educating children to make healthy food choices, will strengthen the lessons learned at school, creating consistency in the application of balanced nutrition practices (Khairunnisa et al., 2020; Abdulai et al., 2019). This collaborative role between teachers and parents is expected to enhance children's awareness and encourage the adoption of healthy lifestyles, which can reduce the incidence of malnutrition and its long-term impacts (Gibbs et al., 2020).

The Healthy Kids Program is also designed to support the government's efforts to reduce stunting and malnutrition among children, in line with the Sustainable Development Goals, particularly Goal 2, which focuses on ending hunger and ensuring access to safe, nutritious, and sufficient food (UNICEF, 2022). Through this program, the children of Rangkasbitung will be empowered with the knowledge and skills to understand the importance of nutrition and apply it in their daily lives, contributing to their health and learning achievements (Utami et al., 2021). With interactive learning methods proven to improve children's motivation and understanding of health education (Wiggins et al., 2021; Kurniawan et al., 2023), the Healthy Kids Program is expected to become a sustainable model for nutrition education in schools in Rangkasbitung and other regions facing similar challenges.

Based on the aforementioned background, the implementation of the Healthy Kids Program: Improving Children's Nutritional Awareness Through Interactive Learning in Rangkasbitung District is expected to be a strategic effort to enhance the health quality of school-age children in the region. By utilizing interactive educational methods and contextualized materials, this program will not only increase children's knowledge about balanced nutrition but also encourage positive changes in daily eating habits, supported by teachers and parents as facilitators in both school and home environments (Fariza et al., 2022; Mahmudiono et al., 2022). This program is also aligned with the government's priority programs in addressing stunting and malnutrition while supporting children's academic achievements through improved health and nutritional status (UNICEF, 2022; Utami et al., 2021). With the comprehensive approach offered, the Healthy Kids Program will become a model for sustainable community service programs that can be replicated in other regions with similar challenges, making a real contribution to achieving the Sustainable Development Goals related to health and education in Indonesia.

2. METHOD

The Healthy Kids Program: Improving Children's Nutritional Awareness Through Interactive Learning will utilize an interactive education approach involving active participation of children and collaboration with teachers and parents in Rangkasbitung, Banten.Initially, coordination with schools and local health centers will be conducted to map the nutritional status and readiness for program implementation. This stage involves an initial survey of children's eating patterns and identification of educational topics relevant to local needs (Mahmudiono et al., 2022). This data will help tailor interactive materials aligned with the local context and needs of the elementary school children in Rangkasbitung.

A pre-test session will then be conducted to measure the children's knowledge regarding nutrition before the educational intervention. The pre-test will use interactive quizzes with images related to nutritious food, food functions, and daily eating habits (Wiggins et al., 2021). The results of this pre-test will serve as a baseline for measuring the program's impact.The core program activities will involve interactive nutrition education using

educational games (nutrition board games, healthy food puzzles), healthy lunchbox simulations, and group discussions. Children will actively participate under the guidance of the program team and teachers (Fariza et al., 2022). The materials will be delivered in simple language using attractive illustrations to ensure the children understand the concept of balanced nutrition easily.

During the activities, teachers and parents will be involved to support the children in understanding and practicing the knowledge gained in daily life. A short education session for teachers and parents will also be conducted to emphasize the importance of their role in supporting healthy eating habits at home and school (Simatupang et al., 2021).After the educational sessions, a post-test using similar questions from the pre-test will be conducted to evaluate improvements in the children's nutritional knowledge, along with a reflection session where the children will share what they have learned (Khairunnisa et al., 2020). The program will conclude with the distribution of simple educational media (nutrition posters and illustrated booklets) for schools to support ongoing nutrition education.

Table 1. Problem Analysis and Target Outputs

No.	Problem Analysis	Expected Target Outputs
1	Low knowledge of balanced nutrition and healthy eating habits among school-age children	Increased knowledge and understanding of the importance of nutritious food consumption and balanced diets through interactive education
2	Children's eating patterns are high in sugar, salt, and fat while low in fruit and vegetable intake	Behavioral changes in children to choose healthier and more varied foods, increasing their interest in consuming fruits and vegetables in daily life
3	Limited involvement of teachers and parents in supporting healthy eating habits at home and school	Increased awareness and active involvement of teachers and parents in guiding children to practice healthy eating habits both at home and at school
4	Lack of interactive nutrition education media in elementary schools in Rangkasbitung	Availability of simple educational media (posters and illustrated booklets) as sustainable learning materials for nutrition education at schools
5	Absence of baseline data on nutrition literacy among elementary school children in Rangkasbitung	Collection of baseline nutrition literacy data through pre-tests and post-tests to assist schools in mapping and planning further nutrition interventions for students

3. RESULTS AND DISCUSSION

The Healthy Kids Program began with a pre-test assessment to determine the baseline level of children's knowledge regarding balanced nutrition, healthy food choices, and the importance of fruits and vegetables. This assessment used illustrated quizzes to ensure the children could engage and understand the questions easily. The results showed that the average knowledge level was still low (47%), indicating a lack of understanding of the benefits of healthy foods and the risks associated with unhealthy dietary patterns. This finding aligns with global reports emphasizing the challenges of nutritional literacy in low-resource settings (Barrera et al., 2020).The program continued with interactive nutrition education using games, role-playing, and food selection simulations, enabling children to learn actively and enjoyably. The children practiced sorting foods into healthy and unhealthy categories, learned about portion sizes, and participated in storytelling sessions about the importance of consuming

fruits and vegetables. These engaging methods were designed to improve comprehension and motivate behavioral change, consistent with best practices in school-based nutrition interventions (Black et al., 2017).

A post-test was conducted after the educational activities using similar illustrated quizzes to measure knowledge improvement. The results showed a significant increase in understanding, with the average score rising to 83%. The greatest improvements were observed in awareness of the importance of consuming fruits and vegetables (from 43% to 83%) and knowledge of balanced nutrition (from 50% to 85%). These results demonstrate the program's effectiveness in enhancing children's nutrition knowledge within a short period (Croker et al., 2020).

Table 2. Results Of Pra-Test and Post Test

Aspects Assessed	Pre-test Average Score (%)	Post-test Average Score (%)
Knowledge of balanced nutrition	50%	85%
Understanding of healthy food choices	47%	82%
Awareness of the importance of fruits/vegetables	43%	83%
Understanding negative impacts of unhealthy food	49%	81%
Total Average	**47%**	**83%**

The findings indicated that the interactive learning methods effectively addressed knowledge gaps among children while fostering a positive learning environment. Children reported enjoying the activities and expressed excitement about practicing what they learned at home. The interactive approach also encouraged discussions among peers and between children and teachers, reinforcing the learning outcomes and supporting the development of healthy eating habits in their daily routines (Black et al., 2017; Croker et al., 2020).

Overall, the Healthy Kids Program in Rangkasbitung proved to be a practical and impactful community service initiative for improving children's nutritional awareness and literacy. The substantial increase in post-test scores highlights the potential for using interactive, contextually adapted nutrition education in addressing malnutrition and unhealthy dietary patterns among school-aged children. These outcomes can serve as evidence for scaling similar programs to other regions to support broader child health and education improvement goals (Barrera et al., 2020).

3.1 The Effectiveness of Interactive Learning in Nutrition Education

The implementation of interactive learning in the Healthy Kids Program demonstrated its effectiveness in improving children's understanding of balanced nutrition and healthy food choices. Using educational games, storytelling, and food sorting simulations allowed the children to actively participate and engage in the learning process. This interactive method created an enjoyable learning environment, which encouraged participation and curiosity, factors essential in ensuring knowledge retention among young learners. Research has shown that interactive, activity-based learning significantly increases children's comprehension and motivation to adopt healthy behaviors, compared to traditional lecture-based nutrition education methods (Gaines et al., 2020). Moreover, the inclusion of contextualized content during interactive activities helped children connect the learning materials to their daily experiences, making it easier for them to apply the knowledge gained. For instance, the use of local fruits and vegetables in simulation activities provided relatable examples, fostering children's awareness of healthy food options that are accessible in their environment. Studies have emphasized that interactive nutrition education, when tailored to the local context, can enhance the relevance of information, leading to better learning outcomes and the potential for sustainable behavior change (Langford et al., 2015).

Additionally, the collaborative learning environment fostered during the program, involving discussions among peers and facilitation by educators, contributed to enhancing children's critical thinking regarding food choices. This aligns with evidence indicating that interactive educational environments encourage social learning, which reinforces positive attitudes toward nutrition and supports the development of decision-making skills related to healthy eating (Savoie-Roskos et al., 2017). The significant improvement in post-test scores achieved in this program confirms the value of interactive methods in nutrition education for young children and highlights the need for such approaches to be integrated into regular school health programs.

3.2 Behavioral Changes and Family Engagement in Nutrition Practices

The Healthy Kids Program not only succeeded in increasing children's knowledge of balanced nutrition but also fostered positive behavioral intentions toward healthy eating practices. During post-activity reflections, many children expressed enthusiasm about choosing fruits over sugary snacks and were excited to share their learning with their families. This behavioral shift is critical because, while knowledge is essential, actual change in dietary behavior is the ultimate goal of nutrition education interventions. Research indicates that interactive nutrition education can lead to improvements in dietary behaviors among children when the learning process is engaging and practical (Taylor et al., 2017). Family involvement played a crucial role in reinforcing the learning outcomes of the program, as children often depend on their families for food choices and dietary practices. Parents who observed and participated in parts of the program reported becoming more aware of their roles in shaping their children's dietary habits, resulting in efforts to prepare healthier meals at home. Evidence suggests that family-centered nutrition interventions are more effective in promoting sustained behavior change among children, as parental modeling and reinforcement significantly influence children's eating behaviors (Fulkerson et al., 2018). This highlights the importance of including parents and caregivers in community-based nutrition programs to create supportive environments for children's healthy eating habits.

The integration of nutrition education into the home environment extends the impact of school-based interventions, ensuring that knowledge and practices acquired during the program are reinforced daily. Families who engage in discussions about healthy eating and involve children in food preparation activities can help sustain the adoption of healthy behaviors beyond the classroom. Studies show that when children actively participate in meal planning and preparation at home, it increases their willingness to consume healthier foods and supports the development of long-term positive dietary habits (Quelly, 2019). Thus, the Healthy Kids Program effectively demonstrates how combining interactive education at schools with family engagement can promote meaningful and lasting improvements in children's nutrition practices.

3.3 Sustainability and Implications for Community-Based Nutrition Programs

The success of the Healthy Kids Program highlights the potential for integrating interactive nutrition education into community-based initiatives to address child malnutrition effectively. The structured use of games, simulations, and discussions creates an enjoyable learning environment while instilling practical knowledge applicable to daily practices. Sustainability of such interventions is critical, as short-term improvements in knowledge must translate into long-term behavioral changes to impact nutritional status significantly. Literature emphasizes that for community-based nutrition programs to be effective, they must be designed to be replicable, culturally sensitive, and adapted to local contexts to ensure relevance and ownership within the community (Story et al., 2008).

The provision of simple and engaging educational materials such as posters and illustrated booklets during the program further supports sustainability by equipping schools with resources to continue nutrition education independently. Additionally, the baseline and post-program data collected from the pre-test and post-test provide valuable insights into children's learning progress, allowing schools and local health stakeholders to monitor, plan, and implement further interventions as needed. Studies have found that monitoring and evaluating the outcomes of community-based nutrition programs are essential for assessing impact and guiding future program development to address ongoing nutritional challenges in the community (Perez-Escamilla et al., 2015).

Moreover, aligning community-based nutrition interventions with broader public health and education policies enhances their sustainability and scalability. Collaborative efforts between schools, families, and local health services contribute to creating a supportive environment that enables children to practice healthy eating consistently. Research indicates that community programs aligned with national health strategies and school health frameworks are more likely to secure institutional support, resources, and long-term sustainability, thereby contributing significantly to achieving public health goals, including the Sustainable Development Goals (McLeroy et al., 2015). The Healthy Kids Program in Rangkasbitung can serve as a scalable model for similar communities seeking to improve children's nutrition literacy through sustainable and engaging methods.

4. CONCLUCTION

The implementation of the Healthy Kids Program in Rangkasbitung demonstrated the effectiveness of interactive learning methods in increasing children's knowledge of balanced nutrition and encouraging healthy eating behaviors. Through engaging activities such as educational games, simulations, and discussions, children actively participated in learning, leading to a significant improvement in post-test scores. The involvement of parents and teachers further strengthened the program by providing consistent reinforcement of healthy practices at home and school, fostering an environment that supports behavior change.

The program also successfully integrated community-based approaches by providing educational materials and building local capacity for sustained nutrition education, aligning with national health and education goals. The baseline data obtained from the pre-test and the improvements observed post-intervention serve as valuable resources for future planning and monitoring of school-based nutrition programs in Rangkasbitung. This approach

aligns with evidence supporting the effectiveness of culturally appropriate, interactive, and community-engaged strategies in addressing malnutrition among school-aged children.

Overall, the Healthy Kids Program offers a scalable and replicable model for addressing nutritional challenges in similar communities. It underscores the critical role of combining interactive learning, family engagement, and community support to improve children's nutrition literacy and dietary practices, contributing to long-term public health goals, including reducing malnutrition and promoting healthy lifestyles among children.

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