

PROVISION OF HEALTHY MENU INNOVATION FOR DEVELOPMENT OF CHILDREN IN EARLY CHILDHOOD EDUCATION

Febry Mutiariami Dahlan^{1*}, Jenny Anna Siauta²

¹Midwifery Department, Faculty of Health Sciences, Universitas Nasional

*²Program Study Of Professional Midwifery Education, Faculty of Health Sciences,
Universitas Nasional*

** Corresponding Author: febrymutia@civitas.unas.ac.id*

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Abstract

The quality of health and development among children in later stages of life is greatly influenced by early childhood education (PAUD). At this stage, balanced nutrition is very important for building healthy living habits, physical growth, and cognitive development. However, the common problem is that children do not like to eat vegetables. As a result, they do not get enough nutrients, especially vitamins and fiber. Therefore, new healthy and appealing menu must be created. One of the innovations offered by this community service program was made healthy carrot gummies. Carrots were chosen because they contain vitamin A, beta-carotene, fiber, and other essential nutrients that were important for maintaining eye health, boosting the immune system, and supporting children's growth. Thru more preferred form and taste, processing carrots into gummies was expected to increase children's interest in eating vegetables. The aim of this service is to enhance children's interest in vegetable-based products, improve the nutritional quality of children in early childhood education, and provide easily accessible and healthy snack options. The expected benefits are an increase in nutritional intake, especially vitamin A, and the establishment of healthy eating habits from a young age. This activity was conducted with twenty preschool children thru

various steps. They selected the raw materials, made carrot gummies, conducted trials to see if the children accepted them, and evaluated their reactions. The results of activity showed that children prefer to eat healthy snacks that were visually appealing. Additionally, parents and early childhood educators learned about the importance of balanced nutrition. Overall, this activity influences children's eating patterns and family nutrition awareness. It is hoped that similar activities can be conducted sustainably so that the habit of consuming healthy menus among early childhood education (PAUD) children can be consistently formed.

Keywords: Complementary; Development; Early Childhood Education; Food Innovation.

Introduction

Early childhood children who are in Early Childhood Education (ECE/PAUD) institutions are in a phase of very rapid growth and development. In this phase, children require balanced nutrition to support brain, physical, and immune system development. Early Childhood Education (PAUD) in the Lembang area, West Java, is an institution that accommodates children in their golden growth period. The Lembang region is known for its abundant vegetable farming potential, yet ironically, vegetable consumption among children remains low. Young children tend to prefer sweet, savory, and instant foods over vegetables, which are considered less appealing. The situation faced by the partner (PAUD Lembang) is the low consumption of vegetables among PAUD children, even tho the surrounding area has the potential for agricultural products like carrots; the lack of variety and innovation in healthy menus provided at school, making children more interested in unhealthy snacks easily found in the surrounding environment; the limited knowledge of parents and PAUD teachers in processing vegetables into attractive and child-friendly snack forms; and the risk of micronutrient deficiencies such as vitamin A and fiber, which can affect the immune system, eye health, and optimal growth of children.

Thru the innovation of carrot-based gummies, the problem can be addressed with a creative approach that utilizes local agricultural products. Carrot gummies can become a healthy, nutritious, and appealing snack, thereby indirectly increasing the interest of PAUD Lembang children in consuming vegetables. Thus, this program not only

supports children's growth and development but also empowers local potential as a source of healthy food.

Carrots, beside being easily available in Lembang, which is a center for highland vegetables, have nutritional content that is very beneficial for children's growth and development. Carrots are rich in beta-carotene, which is converted into vitamin A in the body. This nutrient plays an important role in maintaining eye health, boosting the immune system, and supporting the growth and development of cells and tissues in young children.

In addition to vitamin A, carrots also contain vitamin C, vitamin K, fiber, and antioxidants. Vitamin C helps boost immunity and speed up wound healing, vitamin K plays a role in blood clotting and bone health, while fiber helps smooth the child's digestive system. The antioxidants contained in carrots can also protect body cells from damage caused by free radicals, making children healthier and more energetic in their daily activities.

By processing carrots into gummies with a chewy texture and natural sweetness, children at PAUD Lembang can obtain the nutritional benefits of carrots in a more appealing form that suits their taste. This innovation not only provides a solution to the low vegetable consumption but also helps improve children's nutritional status thru enjoyable healthy snacks. Thus, this program is expected to foster the habit of consuming vegetables from an early age, which will have a positive impact into adulthood.

Method

The community service activity was implemented through several systematic stages to ensure effective planning, execution, and evaluation. The first stage was the pre-activity phase, which focused on preparation and coordination. This phase included strategic planning such as preparing the activity rundown, distributing invitations, and assigning tasks to the implementation team. In addition, the selection of raw materials was conducted to ensure the quality and nutritional value of the ingredients used. The process of making carrot gummies and conducting an initial taste test was also carried out to assess acceptability. Coordination with the PAUD institution was undertaken to determine the venue, schedule, and technical aspects of the activity.

The second stage was the implementation phase, which involved direct interaction with participants. This phase began with recording the attendance of invited participants. Pre- and post-education questionnaires were distributed to parents of PAUD children to measure changes in knowledge related to nutrition and healthy eating. The educational session was then delivered, focusing on the importance of balanced nutrition and creative healthy food innovations for early childhood. After the counseling session, carrot gummies were distributed to the children, followed by an interactive question-and-answer session with parents to reinforce understanding and encourage active participation.

The final stage was the post-activity phase, which emphasized reflection and assessment. Data collected from questionnaires and observations were compiled and analyzed to evaluate the effectiveness of the activity. An overall evaluation was conducted to identify achievements, challenges, and areas for improvement. Additionally, an extension component of the program was carried out under the title *Provision of Healthy Menu Innovation*, which took place at PAUD Kartini Lembang on November 28, 2026, targeting both children and parents. This structured approach ensured that the activity achieved its educational and nutritional objectives effectively and sustainably.

Results

The provision of interventions in this community service activity is focused on efforts to increase the interest in vegetable consumption and fulfill the balanced nutrition of early childhood education (PAUD) children through the innovation of a healthy menu in the form of carrot gummies. The intervention was carried out with 20 early childhood education (PAUD) children using an educational, participatory, and enjoyable approach. The initial stage of the intervention began with activities introducing healthy food, specifically carrots, through the delivery of simple material tailored to the characteristics of early childhood. Children are introduced to the color, shape, and benefits of carrots in an easily understandable language.

Next, the service team conducted a demonstration on making carrot gummies as a form of practical education on processing vegetables into healthy snacks. This process is not only aimed at children but also involves early childhood educators and parents as

companions. This involvement aims to enhance the knowledge and skills of adults in providing healthy snack alternatives that can be applied in daily life. After the production process is complete, carrot gummies are distributed to the children for direct tasting. Children are encouraged to recognize the taste, texture, and shape of the gummy as part of a fun learning experience.



Figure 2. Material Provision and Gummy Making

The intervention is also complemented by habituation activities, which include providing examples of healthy snack consumption patterns and simply explaining the benefits of consuming nutritious food for the body. This approach is expected to foster a positive attitude in children toward healthy food from an early age. In addition, parents and educators are given guidance on the importance of consistency in implementing healthy menus at home and in the school environment so that the intervention results can be sustainable.



Figure 3. Gummy Distribution

The evaluation of this community service activity is conducted to assess the effectiveness of the intervention in the form of providing an innovative healthy menu of carrot gummies to increase the interest in vegetable consumption and nutritional awareness among early childhood education (PAUD) children. The evaluation process is carried out in stages using methods such as direct observation, discussions, and feedback from educators and parents. The evaluation is not only focused on the children's responses but also on the understanding and involvement of the supporting environment, namely teachers and parents.

Evaluation of preschool children is conducted thru behavioral observation during activities, particularly during the introduction of materials, the tasting process, and after consuming the carrot gummies. The observed indicators include the children's enthusiasm, willingness to try the snack, expressions while consuming it, and simple verbal responses shown by the children. The observation results show that most children displayed a high level of interest in carrot gummies, both in terms of color, shape, and taste.

Children appeared more enthusiastic and willing to consume carrot preparations compared to conventional vegetables, which were previously less favored. In addition, an evaluation was also conducted with early childhood educators and parents thru discussions and Q&A sessions after the activities took place. The evaluation results show an increase in understanding regarding the importance of balanced nutrition for the growth of early childhood. Educators and parents stated that the healthy menu innovation in the form of carrot gummies is considered practical, easy to make, and can be an alternative healthy snack at home or at school. They also

expressed a new awareness of the importance of creativity in food presentation to make children more interested in consuming nutritious food.

Overall evaluation shows that the intervention provided a positive impact on children's attitude changes, an increase in nutritional knowledge among parents and educators, as well as the potential for sustainable implementation of healthy menu innovations. However, this activity still has limitations, including a relatively short implementation duration and the absence of quantitative measurements of changes in children's nutritional status. Therefore, follow-up activities are needed with a longer duration of assistance and a more comprehensive evaluation to achieve optimal and sustainable results.

Discussion

Early childhood is widely recognized as a critical period that determines health and developmental outcomes later in life. During this *golden age*, adequate nutrition plays a central role in supporting physical growth, cognitive development, and immune function [1]. However, low vegetable consumption among early childhood children remains a common nutritional problem, often caused by children's dislike of taste, texture, and appearance of vegetables [2]. Therefore, innovative approaches are required to improve children's acceptance of nutritious foods.

The carrot gummy innovation implemented in this community service activity was designed based on child development and nutrition theories. According to Piaget's cognitive development theory, children at the preoperational stage learn effectively through concrete, visual, and enjoyable experiences [3]. Transforming carrots into gummy snacks provides a multisensory experience that aligns with children's developmental characteristics, making healthy food more appealing and easier to accept.

From a nutritional perspective, carrots are a rich source of vitamin A and beta-carotene, which are essential for maintaining eye health, supporting immune function, and promoting normal growth in children [4]. Vitamin A deficiency remains a public health concern in many developing regions and is associated with increased susceptibility to infections and growth disorders [5]. The use of carrot-based gummies offers a practical alternative to improve vitamin A intake among early childhood children.

The results of this activity showed increased interest and willingness among children to consume carrot gummies compared to conventional vegetable dishes. This finding is consistent with previous studies indicating that children's food preferences are strongly influenced by food presentation, color, texture, and taste rather than nutritional value alone [6]. Research on food acceptance has demonstrated that innovative and visually attractive food forms can significantly improve vegetable intake in young children [7].

The intervention also emphasized repeated exposure and positive experiences, which are essential components of habit formation. Behavioral theories suggest that early exposure to healthy foods in enjoyable contexts increases the likelihood of long-term healthy eating habits [8]. Several studies have confirmed that dietary habits established in early childhood tend to persist into later life stages [9].

Parental and teacher involvement in this activity further strengthened its effectiveness. Based on Bronfenbrenner's ecological systems theory, children's behavior is shaped by their immediate environment, particularly family and educational settings [10]. Increased knowledge and awareness among parents and teachers regarding creative healthy food preparation positively influence children's eating behaviors [11].

Despite the positive outcomes, this activity had limitations. The intervention was conducted over a short period and relied mainly on qualitative evaluation through observation. Previous studies suggest that long-term interventions and quantitative nutritional assessments are needed to measure sustained behavioral change and nutritional impact [12].

Overall, the carrot gummy innovation demonstrates a theoretically grounded and practical approach to improving vegetable consumption among early childhood children. Supported by developmental, nutritional, and behavioral theories, this intervention has strong potential to be replicated as a sustainable community-based strategy to promote healthy eating habits from an early age.

Conclusion

Community service activities thru the provision of healthy menu innovations in the form of carrot gummies for early childhood education (ECE / PAUD) children have

shown positive results in increasing children's interest in consuming vegetables. The innovation of processing carrots into snacks with attractive shapes and appearances has proven to be more easily accepted by young children compared to the conventional presentation of vegetables. In addition to providing nutritional benefits, particularly vitamin A intake, this activity also contributes to shaping positive experiences for children with healthy food from an early age. The involvement of early childhood educators and parents in this activity also enhances the understanding of the importance of balanced nutrition and creativity in food presentation. Overall, the innovation of carrot gummies can serve as a practical and educational alternative solution in efforts to improve nutrition and establish healthy eating habits in early childhood education (PAUD) children.

It is hoped that similar community service activities can be carried out sustainably with a longer mentoring period so that the habit of consuming healthy food in children can be consistently formed. Additionally, it is recommended to conduct follow-up evaluations quantitatively to measure the impact of the intervention on children's nutritional status. Collaboration between early childhood educators, parents, and healthcare professionals also needs to be enhanced to support optimal monitoring of children's growth and development, as well as to expand the implementation of healthy menu innovations in school and family environments.

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