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Nutrition Education Videos: Influence on Fruit and Vegetable Consumption and Prevention of Childhood Obesity

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ABSTRACT

The imbalanced nutritional status in children can negatively affect their health, growth, development, and ability to carry out daily activities. Nutritional problems in children, represent a significant challenge that requires focused attention due to the continuous increase prevalence. Dietary patterns, such as inadequate intake of vegetables and fruits, increase the risk of nutritional issues. Most school-aged children tend to be selective and avoid certain types of vegetables and fruits due to a lack of knowledge regarding their importance. Therefore, the aim of health education is to increase children's knowledge, encourage them to adopt healthier eating habits, and improve vegetable and fruit consumption behaviors. The "MASAYBU (Let's Eat Vegetables and Fruit) Every Day" program has targeted school-aged children (6-12 years old) through delivering information by video. It was implemented as a strategy to address obesity and enhance awareness of the importance of daily vegetable and fruit consumption. The program was attended by 31 children from a primary school within the UPTD Puskesmas Cinere area. A Wilcoxon test using IBM SPSS Statistic version 25 was conducted to evaluate the difference in knowledge before and after the intervention. The analysis showed p-value=0.000 (p<0.05), indicating that the "MASAYBU" educational video significantly improved children's knowledge of the importance of daily vegetable and fruit intake. The results demonstrate that the educational intervention effectively enhanced awareness and knowledge about daily vegetable and fruit consumption among school-aged children.

***Keywords**: Education, School Age Children, Vegetables and Fruits, Nutritional Knowledge, Nutritional Intervention*

INTRODUCTION

Indonesian children enter elementary school around the age of 6 and finish at 12. The development period for school-age children is divided into two parts: 6-9 years old, including middle childhood, and 10-12 years old, including late childhood (Tomasoa et al., 2021). This age group is one of the groups that is vulnerable to nutritional problems (Permatasari et al., 2023). Lack of awareness of food intake or the types consumed will affect their nutritional status (Novianti & Utami, 2021). Poor nutritional status of children can affect physical growth, mental development, and thinking processes, thus impacting daily activities. The nutritional status of school-age children greatly influences human resources in the future of the next generation. Nutritional problems in children are a challenge that needs special attention because the increase in prevalence continues and continues to occur yearly in various countries (Safitri et al., 2022).

Based on data from the Indonesian Health Survey SKI (Survei Kesehatan Indonesia) in 2023, the prevalence of nutritional status (BMI-for-age) of children aged 5-12 years in Indonesia is 3.5% severely thinnes, 7.5% thinnes, 11.9% overweight, and 7.8% obese. A person's nutritional status can be assessed from two factors, namely, direct and indirect causes. Direct causes include food consumption and diet, while indirect causes include knowledge about nutrition, education, and income levels (Permatasari et al., 2023). In addition, there are several factors that specifically impact specific nutritional status problems. Factors that can influence malnutrition include the living environment, sanitation hygiene, low levels of knowledge, intake that does not meet needs, and low socioeconomics. Meanwhile, factors that can influence obesity include genetic factors, socioeconomics, low levels of knowledge, living environment, lifestyle, and diet (Novianti & Utami, 2021).

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The prevalence of overweight and obesity in school-age children is showing quite alarming figures. Overweight and obesity are terms used to define people's excess body weight. Obesity is a metabolic condition characterized by the accumulation or buildup of excess fat (Sriwahyuni et al., 2021). Determination of overweight and obesity status in school-age children is measured based on the Body Mass Index for Age (BMI-for-age). It is said to be overweight if it is between the z-score numbers +1SD to +2SD and is said to be obese if the number is> +2SD (Kemenkes RI, 2020). Overweight and obesity can lead to dangerous impacts in the form of non-communicable diseases such as diabetes mellitus, coronary heart disease, hypertension, and kidney disorders (Abdullah et al., 2024). Eating patterns affect children's nutritional status, such as breakfast habits, snack consumption, vegetable intake, fruit intake, and frequency of main meal consumption. There is a tendency for school-age children to choose and avoid certain types of food, such as some types of vegetables and fruits, as less favorite foods (Ladiba et al., 2021). This is based on the need for more awareness among the Indonesian people, including school-age children, about the importance of consuming vegetables and fruits. Vegetables and fruits are sources of micronutrients needed in the body's metabolic processes (Kemenkes RI, 2014). Vegetables and fruits are sources of vitamins, minerals, and fiber the body requires. Vegetables and fruits can maintain a healthy digestive system so that it runs smoothly and does not experience digestive system disorders. Green vegetables and fruits contain antioxidants, vitamin C, and vitamin A, which can help prevent obesity in school-age children (Farida et al., 2022).

Therefore, structured nutrition program activities are needed to prevent overweight and obesity in school-age children. Several government programs have been running to address nutrition problems in school-age children. However, special programs or programs that directly impact obesity problems and awareness of vegetable and fruit consumption in school-age children are not yet available. One of the causes of low vegetable and fruit intake in school-age children is the lack of knowledge about the importance of vegetable and fruit consumption (Febriani et al., 2024). Providing education about vegetable and fruit consumption every day is very important because it can affect children's daily attitudes, including eating patterns. Therefore, the education program was implemented in one of the elementary schools in the Puskesmas Cinere area to increase children's knowledge, apply it to good eating habits, and increase vegetable and fruit consumption behavior.

METHODS

Nutrition educational programs were held at an elementary school in the UPTD Puskesmas Cinere (Community Health Centers in Cinere) area, Depok City, West Java, on September 11, 2024. This program was one of the intervention methods selected to educate about the importance of consuming vegetables and fruits daily. The target of the activity was 31 school-age children. The media used animated videos focusing on the main character's behavior in the storyline. Animated videos were chosen as the media because of their ability to stimulate children's imagination with dynamic and colorful images. In addition, animation can capture children's attention, making it easier for them to cognitively, affectively, and psychomotorically comprehend (Fahriza et al., 2021).

Figure 1. Animated Video Media Clip

The educational program is called "MASAYBU (Let's Eat Vegetables and Fruit) Every Day". MASAYBU is an Indonesian abbreviation for "Let's Eat Vegetables and Fruit" (Mari Makan Sayur dan Buah). This program began with an opening and filling out a pre-test. Afterward, an animated video was presented, featuring content about obesity and emphasizing the importance of daily consumption

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of vegetables and fruits. After that, the question-and-answer and educational game sessions continued to increase children's participation and engagement in the activities. The educational game involved a matching activity using a glue stick to pair different types of vegetables or fruits with their respective nutritional content, as explained in the video. The game was designed to help children remember and understand that certain types of vegetables and fruits have nutritional value and contribute to good health. Hopefully, this will encourage them to eat more vegetables and fruits daily. The activity continued with a post-test to assess changes in children's knowledge after watching the video. The program was closed by giving souvenirs to the participants.

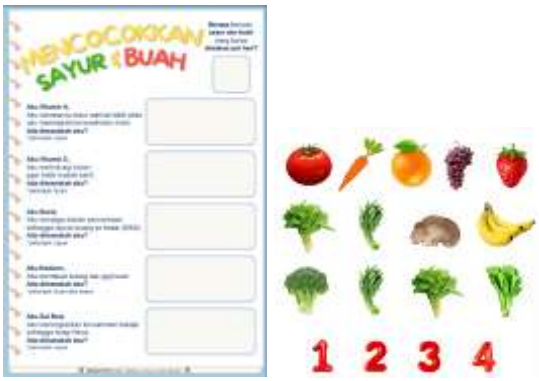

Figure 2. Supporting Media for Educational Games

The target of the "MASAYBU" program is to increase elementary school students' knowledge of the importance of consuming vegetables and fruits every day. The method used to measure the increase in knowledge is by evaluating the results of a pre-test before the intervention activity and a post-test after the intervention activity. The contents of both knowledge questionnaires in the pre-test and post-test are the same, namely in the form of multiple-choice questions with ten questions. The pre-test and post-test results were evaluated using the Wilcoxon test with IBM SPSS software version 25 to test the difference between the average scores before and after education was given. The Wilcoxon test was chosen because the normality test (Shapiro-Wilk Test) results obtained a *p-value* <0.05, meaning the data is not normally distributed. The use of the Shapiro-Wilk test as a normality test was carried out because the number of respondents in this activity was less than 50. The univariate pre-test and post-test results fall into different categories. They are considered low if the score is less than 60%, good if the score is between 60% and 80%, and very good if the score is above 80%.

RESULTS AND DISCUSSIONS

CHILDREN'S ACTIVENESS AS INTERVENTION PARTICIPANTS

The implementation of the "MASAYBU" educational program was successful. During the activity, children actively participated. This was measured by the number of children who dared to express their opinions during the question-and-answer session and asked questions during the educational game session. Four children bravely came forward to explain the story and the main message conveyed in the displayed video. Then, approximately ten children actively asked questions during the educational game session.

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Figure 3. Implementation of MASAYBU Program

Univariate Analysis

According to Table 1, before receiving educational intervention, 18 school-age children (58.1%) had very good knowledge, 6 children (19.4%) had good knowledge, and 7 children (22.6%) had low knowledge. Meanwhile, after being given educational intervention, 25 children (80.6%) had very good knowledge, 3 children (9.7%) had good knowledge, and 3 children (9.7%) had low knowledge.

Table 1. Distribution of School-Age Children's Knowledge Before and After Intervention

Category	*Pre-Test*		*Post-Test*	
	n	%	**n**	%
Low	7	22.6%	3	9.7%
Good	6	19.4%	3	9.7%
Very Good	18	58.1%	25	80.6%
Total	**31**	**100%**	**31**	**100%**

Based on Table 2. it is known that the average pre-test score before being given education is 81.61, and the average post-test score after being given education is 90.96. The lowest score obtained from the pre-test is 40, and the highest score is 100. Meanwhile, the lowest score obtained from the post-test is 50, and the highest is 100. Therefore, there is an increase in both the average and minimum scores before and after the intervention.

Table 2. Overview of Knowledge Scores of School-Age Children

Knowledge	Mean	Min-Maks
Before Education	81.61	40-100
After Education	90.96	50-100

Bivariate Analysis

Prior to testing for differences, a normality test was conducted. The Shapiro-Wilk normality test was used because the sample size was 31 children, which is less than 50. The decision in the Shapiro-Wilk normality test is based on the significance value. The data is normally distributed if the significance value is >0.05. The data is considered not normally distributed if the significance value is <0.05. Based on the results of the test, it is known that the significance value of the pre-test and post-test is p = 0.000 or p <0.05. It is concluded that the data is not normally distributed in both. Therefore, the non-parametric test will proceed using the Wilcoxon test.

Table 3. Shapiro-Wilk Normality Test

Testing	df	Sig.
Pre-Test	31	0.000
Post-Test	31	0.000

According to the results of the Wilcoxon test in Table 4, it is evident that no children experienced a decrease in value from the pre-test to the post-test, as indicated by the negative ranks. On the other hand, positive ranks show that 20 children experienced an increase in value after receiving

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the intervention. Additionally, there were 11 children whose values remained the same from pre-test to post-test or did not experience a decrease or increase after the intervention, as indicated by ties.

Table 4. Knowledge Value Improvement Test

		N
Post-Test – Pre-Test	*Negative Ranks*	0[a]
	Positive Ranks	20[b]
	Ties	11[c]
	Total	**31**

Notes: [a] Post Test < Pre Test, [b] Post Test > Pre Test, [c] Post Test = Pre Test

Based on the results of the Wilcoxon test in Table 5, it is evident that the *p-value* is p = 0.000. This indicates a significant difference between the pre-test and post-test values. It can be inferred that providing education intervention about strategies to influence the consumption of vegetables and fruits using video can enhance children's knowledge about the importance of consuming vegetables and fruits daily. This aligns with a study by Harsismanto et al. (2019) on health education using video media, which significantly influences children's knowledge and behavior. Moreover, Febriani et al. (2024) also provided education about the importance of consuming fruits and vegetables using visual, audio, and audio-visual media. The pre-test and post-test results evaluation revealed a *p-value* of <0.05, concluding that this activity increases school-age children's awareness of the importance of consuming vegetables and fruits.

Table 5. Wilcoxon Test Results

	Post-Test – Pre-Test
Z	-4.064
Asymp. Sig. (2-tailed)	0.000

CONCLUSION AND RECOMMENDATION

The educational program "MASAYBU (Let's Eat Vegetables and Fruits) Every Day" for school-age children has been successfully implemented. The evaluation, conducted using the Wilcoxon test, resulted in a p-value of 0.000, indicating that the program effectively increased the knowledge of school-age children about the importance of consuming vegetables and fruits. The use of animated video media was found to be an effective method for educational counseling, as children are more engaged with interactive characters, which stimulates their imagination.

It is expected that school-age children can increase awareness and change their behavior to desire to consume vegetables and fruits. This can be achieved with the support of parents and the environment. It is hoped that in the future, a situation analysis and nutrition program can be implemented for parents of school-age children. Additionally, it is hoped that the government, supported by schools and health workers, will implement a direct program to increase vegetable and fruit consumption in school-age children.

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