



The Effect of Balanced Nutrition Education Using Video and Puzzle on the Level of Knowledge about Nutrition in School-Age Children

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Abstract

School-age children are one of the most vulnerable groups in terms of nutrition. Nutritional problems in school-age children are undernutrition and overnutrition. Nutritional problems that occur in school-age children are caused by a lack of knowledge about the importance of nutritional adequacy. Education is the provision of knowledge about something to increase knowledge. Nutrition education can be provided with attractive media so that information about balanced nutrition can be of interest to school-age children. This study used a quantitative approach using the one group pre test post test method. The sample in the study amounted to 50 6th grade students who were taken using sampling total. The analysis used the Wilcoxon statistical test. After being given education using video and puzzle media on the level of knowledge about nutrition in school-age children, the results showed an increase in mean knowledge between pre and post tests. The mean value before being given balanced nutrition education was 33.24 (SD = 17.146), after being given balanced nutrition education the mean increased to 79.42 (SD = 9.026). The results of the Wilcoxon test analysis show that there is an effect of balanced nutrition education using videos and puzzles with a p value $(0.000) < \alpha (0.005)$. The use of balanced nutrition education using videos and puzzles has an effect in increasing knowledge about nutrition in school-age children at SDN 021 Tanjung Palas..

Keywords: Balanced Nutrition, Education, Knowledge, School-Age Children



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INTRODUCTION

School-age children are a group highly vulnerable to nutritional problems, which can adversely affect their physical, mental, and intellectual development. Nutritional issues in school-age children in Indonesia generally involve two aspects: undernutrition and overnutrition, both of which can negatively impact the growth and development potential of children (Ahmad, Antoni, & Muhamad, 2023). According to WHO data (2018), around 22% of school-age children worldwide suffer from undernutrition, while, on the other hand, 340 million children aged 5-19 years are affected by obesity. In Indonesia, data from the Basic Health Research (2018) shows that nutritional problems in school-age children, such as undernutrition, overweight, and obesity, remain significant issues. One of the factors affecting children's nutritional status is irregular eating patterns and unhealthy eating habits. Children tend to choose snacks or eat outside the home, which often contains unbalanced nutrition (Anggiruling, Ekayanti, & Khomsan, 2019). This condition greatly affects their ability to undergo optimal growth and development.

Nutritional education is an essential step in addressing these problems. Increasing knowledge about balanced nutrition in school-age children can help them understand the importance of choosing nutritious foods for their bodies. The use of engaging educational media, such as animated videos, has proven effective in enhancing understanding of balanced nutrition among school-age children (Rahmatiani & Kartajin, 2023). Additionally, educational media based on games, such as puzzles, can also improve children's memory and cognitive skills in understanding nutritional concepts (Safitri, Sulistyowati, & Ambarwatu, 2021). However,

many areas in Indonesia continue to face nutritional problems in school-age children, including in Dumai City, Riau Province. According to surveys, problems with undernutrition and excessive body weight are still found among children in this region. Socioeconomic factors and a lack of public awareness regarding the importance of nutrition are some of the primary causes of this issue (Lesmana et al., 2023; Putra, Aditama, & Cahyani, 2022). As the nutritional problems in school-age children continue to increase, it is crucial to provide the right and engaging education to improve their knowledge about nutrition. This study aims to further explore the impact of educational media based on animated videos and puzzles on increasing nutritional knowledge among school-age children at SDN 021 Tanjung Palas, Dumai City.

RESEARCH METHODS

The research design used by the researcher is a quasi-experiment with a one-group design using a pre-test and post-test approach, aimed at examining the difference in knowledge between the pre-test and post-test. This study does not use a comparison group but instead uses an initial test (pre-test) so that the effect of using video and puzzle media can be clearly identified. The sampling technique used in this study is total sampling with inclusion criteria, namely 6th-grade students who are experiencing issues with undernutrition status. The bivariate analysis used in this study is the Wilcoxon test.

RESEARCH RESULTS AND DISCUSSION

This study was conducted in September 2024 at SDN 021 Tanjung Palas Dumai, involving 50 respondents. The results obtained are as follows:

Respondent Characteristics

Table 1. Distribution of Respondent Characteristics

| Characteristics | Frequency (n) | Percentage (%) |
|-----------------|---------------|----------------|
| Age | | |
| 1. 10 years old | 1 | 2.0 |
| 2. 11 years old | 11 | 22.0 |
| 3. 12 years old | 36 | 72.0 |
| 4. 13 years old | 2 | 4.0 |
| Gender | | |
| 1. Male | 24 | 48.0 |
| 2. Female | 26 | 52.0 |
| Total | 50 | 100 |

Table 1 above shows that out of the 50 respondents surveyed, the distribution of respondents by age for 6th-grade students shows that the majority are 12 years old, with a total of 36 individuals (72.0%). The gender distribution of the respondents in the table above indicates that the majority are female, with a total of 26 individuals (52.0%).

Knowledge of School-Age Children Before (Pre-test) and After (Post-test) Balanced Nutrition Education

Table 2. Category of Respondents' Knowledge Level Before (Pre-test) Education

| Knowledge Level | Frequency (n) | Percentage (%) |
|-----------------|---------------|----------------|
| 1. Good | 0 | 0.0 |
| 2. Moderate | 5 | 10.0 |
| 3. Poor | 45 | 90.0 |
| Total | 50 | 100 |

The category of pre-test knowledge level in the group can be seen in Table 4.2. The table shows that before the intervention, the majority of respondents had a knowledge level categorized as poor, with 45 individuals (90.0%), and a moderate knowledge level with 5 individuals (10.0%).

Table 3. Category of Respondents' Knowledge Level After (Post-test) Education

| Knowledge Level | Frequency (n) | Percentage (%) |
|-----------------|---------------|----------------|
| 1. Good | 34 | 68.0 |
| 2. Moderate | 16 | 32.0 |
| 3. Poor | 0 | 0.0 |
| Total | 50 | 100 |

The category of post-test knowledge level in the group can be seen in Table 4.3. The table shows that after the intervention, there was an increase in knowledge among the respondents. The majority of respondents had a good knowledge level, with 34 individuals (68.0%), and a moderate knowledge level with 16 individuals (32.0%).

Test of the Effect of Balanced Nutrition Education Using Video and Puzzle

Table 4. The Effect of Balanced Nutrition Education Using Video and Puzzle on School-Age Children's Knowledge

| Variabel | n | Mean | SD | Min | Max | P-Value |
|----------|----|-------|--------|-----|-----|---------|
| Pretest | 50 | 33,24 | 17.146 | 0 | 73 | 0,000 |
| Posttest | 50 | 79,42 | 9.026 | 60 | 100 | |

Based on Table 4, the average score before the balanced nutrition education using video and puzzle was 33.24 with a standard deviation of 17.146. After the education was provided, the average score increased to 79.42 with a standard deviation of 9.026. The data analysis result showed a p-value of $(0.000) < \alpha (0.05)$, which means that H_0 is rejected, indicating a significant difference before and after the intervention using video and puzzle on the level of nutritional knowledge in school-age children.

Discussion

Knowledge of School-Age Children Before (Pre-test) and After (Post-test) Balanced Nutrition Education

Before the balanced nutrition education was provided, the majority of the school-age children had poor knowledge, with 45 out of 50 respondents (90%) categorized as having low knowledge. After the intervention, there was a significant improvement, with 34 respondents showing good knowledge, 16 with moderate knowledge, and no respondents remaining with poor knowledge. This indicates that most children improved their knowledge, with 68% showing high levels of knowledge after the education. This finding aligns with the study by Sujda et al. (2019), which showed a notable increase in knowledge after providing nutrition education to underweight elementary school students. The pre-test scores ranged from 45 to 75, while the post-test scores increased from 55 to 90. Similarly, Rahman and Asikin (2024) found that nutrition education increased knowledge about health and nutrition issues among school-age children, demonstrating the effectiveness of such interventions. However, while education significantly improved knowledge, 16 respondents still had moderate knowledge after the intervention. This suggests that not all respondents were able to achieve high knowledge levels, which could be attributed to several factors. Internal factors such as health, intelligence, and emotional state, along with external factors like environmental conditions



(sound, lighting, temperature) and distractions during the assessment process, can influence learning outcomes. Irnani & Sinaga (2017) highlighted these factors, which may have affected the ability of some children to fully absorb the nutritional knowledge provided.

The Effect of Balanced Nutrition Education on School-Age Children's Nutrition Knowledge

The study results show that the average knowledge score of respondents before the balanced nutrition education (pre-test) was 33.24 with a standard deviation of 17.146, and after the education (post-test), the average increased to 79.42 with a standard deviation of 9.026. The data analysis revealed an average knowledge improvement of 46.18 points. The Wilcoxon test yielded a p-value of $0.000 < \alpha (0.05)$, indicating a significant difference and rejecting the null hypothesis, suggesting that the use of video and puzzle-based balanced nutrition education effectively improved school children's nutrition knowledge. According to Nasution (2020), one factor that can enhance school children's knowledge of balanced nutrition is health education, which is influenced by both internal (motivation) and external (social, cultural, and informational) factors. Providing accessible information and health education can expedite knowledge improvement among students. Media also plays a crucial role in influencing children's knowledge. Since children enjoy new things, using attractive media is essential for presenting balanced nutrition education in a simple and engaging way (Andriyani & Kurniasari, 2022). Faisal et al. (2022) found that video media had a positive impact on improving children's knowledge of balanced nutrition. The use of multiple senses, such as sight and hearing, helps facilitate information retention, which supports Listyarini's (2017) theory that 75%-87% of knowledge can be increased through sensory engagement.

Research by Komara and Pramuditha also confirmed that balanced nutrition education using video media significantly impacted knowledge. The average knowledge score increased from 49.33 to 77.39, a 74% improvement, with a p-value of 0.000, indicating a significant effect. Debora et al. (2020) found similar results with video media, where knowledge increased from an average pre-test score of 56.82 to 88.82 in the post-test, with a p-value of 0.000. Sugiyanto and Mashar (2024) also confirmed the positive impact of video-based nutrition education on improving school-age children's knowledge. Puzzle-based media, which stimulates sensory, motor, and visual skills, also proved effective. This media can capture children's interest through engaging visuals, colors, and text, and can be used for both educational and recreational purposes. Nasution (2020) found that after using puzzle-based nutrition education, knowledge increased among respondents, with 38 showing sufficient knowledge and 15 still with poor knowledge. Tasya, Sulistyaningsih, and Safitri (2024) found that puzzle-based nutrition education also increased knowledge, with average pre-test and post-test scores of 72.79 and 81.76, respectively, and a p-value of 0.000. Similar findings were reported by Oktafiani and Sunarti (2020), who observed an improvement in balanced nutrition knowledge among students after using puzzle media in health education. These results suggest a significant difference in school children's nutrition knowledge before and after the balanced nutrition education using video and puzzle media. The researcher concludes that using audiovisual and visual media, such as video and puzzles, is highly effective in improving nutrition knowledge among school children, as these media enhance material retention and engagement.

CONCLUSION

This study on the effect of balanced nutrition education using video and puzzle on the nutrition knowledge level of school-age children was conducted at SDN 021 Tanjung Palas Dumai in September 2024. The results showed that a majority of the respondents were 12 years

old, and most of the respondents were female. Before the balanced nutrition education using video and puzzle, the majority of the respondents had a low level of knowledge. After the education, there was an improvement in the respondents' knowledge, with the majority now categorized as having good knowledge. This indicates an increase in knowledge before and after receiving the balanced nutrition education using video and puzzle on the nutrition knowledge level of school-age children. The results of this study can be concluded by rejecting the null hypothesis (H_0), which means that there is an effect of balanced nutrition education using video and puzzle on the nutrition knowledge of school-age children.

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