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The Influence of Education About "Isi Piringku" Using Healthy Plate Model Media on Increasing Nutritional Knowledge of Students at SMP Negeri 1 Deli Tua

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ABSTRACT

This study aims to determine the effect of education about "Isi Piringku" with a healthy plate model media on improving nutritional knowledge of students at SMP Negeri 1 Deli Tua. Nutrition is very important in supporting children's growth and development and maintaining health. The research method used was a quasi-experimental with a pretest-posttest design on 60 students. Data were collected through knowledge tests before and after providing education using a healthy plate model media. Data analysis using the Kolmogorov-Smirnov normality test showed that the data were not normally distributed, so the non-parametric Wilcoxon Signed Rank Test was used. The results showed that 59 out of 60 students experienced an increase in nutritional knowledge scores after education (p = 0.0001). This proves that education with the "Isi Piringku" model media is effective in improving nutritional knowledge of students at SMP Negeri 1 Deli Tua. Therefore, it is recommended to use visual educational media in improving nutritional understanding among students.

Keyword : Isi Piringku Education; Healthy Plate Model; Nutritional Knowledge; Nutrition Promotion; Adolescents.

INTRODUCTION

Nutrition is the process of transforming various foods that enter the body into energy and substances that are useful for maintaining life, supporting daily activities, and maintaining the balance of the body's metabolism (Titi Sunardi, 2022). Nutrition is a process experienced throughout life, especially for children's growth and development which is very important for physical, mental, and future development (Suandi, IKG, 2022). Nutrition helps the formation of body cells and keeps the body healthy and able to fight disease.

Adolescence begins with early adolescence (ages 10-12), continues with middle adolescence (ages 13-15), and late adolescence (ages 16-19). Adolescents are particularly vulnerable to nutritional deficiencies because they are in a transitional period. Nutritional status is the state of the human body resulting from food consumption and nutrient

utilization. It is also defined as a person's physical condition determined by one or a combination of specific nutritional measures (Ardiansyah et al. 2016).

A real phenomenon occurring in many schools, including SMP Negeri 1 Deli Tua, is students' low knowledge of healthy eating patterns and balanced nutrition. This is evident in food consumption habits that do not comply with balanced nutrition guidelines, such as low fruit and vegetable consumption and high consumption of fast food or unhealthy snacks. This condition has the potential to increase the risk of health problems such as obesity, anemia, and stunting.

According to UNICEF data in 2020, the prevalence of malnutrition among adolescents in Southeast Asia reached 16%. According to the Basic Health Research (Riskesdes) in 2021, 18% of school-age children experienced nutritional problems. In North Sumatra, the prevalence of malnutrition among adolescents reached 21.5%. Based on data from the Deli Serdang Regency Health Office, there was an increase in cases of nutritional problems from 0.48% in 2020 to 1.46% in 2021. This indicates a serious problem related to nutritional knowledge among adolescents in this area.

One of the government's efforts to address the nutritional status issue is the "Isi Piringku" (My Plate) campaign (Kencana, 2019). "Isi Piringku" is a daily food consumption guide consisting of 2/3 of a half plate of staple foods, 1/3 of a half plate of side dishes from animal and vegetable protein sources, 1/3 of a half plate of fruits, and 2/3 of a half plate of vegetables. It is hoped that after nutritional education, students will change their attitudes and behaviors in the right direction and can improve their health (Proverawati and Wati 2011).

Nutrition Communication, Information, and Education (KIE) for school children can shape children's eating habits from an early age to achieve better individual health in the future (Damayanti et al., 2018). The role of nutrition education through media can assist the process of delivering nutrition messages and motivating the target so that the nutrition messages delivered can be well received (Cita, 2016).

Nutrition education can help improve knowledge and attitudes about healthy lifestyle practices through better eating choices and behaviors (Darawati, 2020). Nutrition education with the help of engaging media can help adolescents understand the material better. Selecting the right media also helps students become more engaged in their learning (Kamsiah, 2020).

RESEARCH METHODS

This type of research is quantitative research using a pre-experimental method with a one-group pretest-posttest research design without a control group. In this research design, a pre-test was conducted, then intervention or treatment was given in the form of education and teaching aids using a healthy plate model media where children were given puzzle pieces depicting various types of food according to the food groups on a healthy plate (staple foods, vegetables, side dishes, fruits). Children were asked to arrange the pieces into a plate shape according to the proportions recommended in the concept. Furthermore, a post-test was given to determine the changes that occurred before and after the intervention and treatment were given.

The sample in this study was all 60 students of class VII at SMP Negeri 1 Deli Tua, taken using the simple random sampling method with the inclusion criteria of SMP students aged 13-14 years, students who regularly participate in learning activities at school, students who have the ability to read and understand educational materials about the contents of my plate. The research was conducted at SMP Negeri 1 Deli Tua, Deli Serdang Regency, North Sumatra. A survey conducted by researchers at SMP Negeri 1 Deli Tua found that the elementary school had a low level of knowledge about nutrition.

RESULTS

Table 1. Descriptive statistics of students' nutritional knowledge scores

	N	Min	Max	Mean	Std.Deviatin
Pretest	60	70	95	82.00	**4,621**
posts	60	80	100	93.08	**5,829**

This table provides an initial overview of students' nutritional knowledge scores before and after receiving education using the "fill my plate" model. The sample size was 60 students. In the pretest, the minimum score was 70 and the maximum was 95, with an average score of 82.00 and a standard deviation of 4.621. This indicates that before receiving education, students' knowledge levels were still within a fairly good range, but with not too much variation among students.

After students received education using the media model of the contents of my plate, the average score on the posttest increased to 93.09 with a minimum score of 80 and a maximum of 100, and the standard deviation increased to 5.829. This higher average score indicates an increase in understanding the concept of balanced plate contents, while the slightly larger

standard deviation indicates a variation in the increase in knowledge that differs between students, possibly due to differences in the level of material absorption or educational delivery methods.

Overall, this table illustrates the positive effect of the educational intervention on students' nutritional knowledge, as seen from the increase in the average posttest score compared to the pretest.

Table 2. Normality test of pretest posttest knowledge scores

variables	kolomogrov simirnov statistics	df	sig. (p-value)
Pretest	0.217	60	**0.000**
Posttest	0.199	60	**0.000**

The second table shows the results of the Kolmogorov-Smirnov normality test, which aims to determine whether the distribution of pretest and posttest scores follows a normal distribution. In statistical analysis, the existence of a normal distribution is an essential prerequisite for determining the appropriate type of test, whether parametric or non-parametric.

The test results show a significant value (p-value) of 0.000.1 for both pretest and posttest scores, indicating that both data are not normally distributed (since $p < 0.05$). This means that parametric tests such as paired t-tests cannot be used to test for differences in scores before and after the educational intervention.

Consequently, researchers need to use non-parametric statistical tests that do not assume normality of data distribution, for example the Wilcoxon signed rank test, to analyze differences in pretest and posttest scores.

Table 3. Results of the Wilcoxon signed rank test of students' nutritional knowledge

Statistics	N	Mean Rank	Sum Of Rank
positive ranks (rising)	59	30.00	**1770**
Negative eranks (down)	0	0.00	**0.00**
ties (same)	1		
Z=-6.74			

P value = 0.0001

The third table displays the results of the Wilcoxon Signed Rank test, used to test the hypothesis of differences in students' nutritional knowledge scores before and after being educated using the "isi piringku" (my plate) model. Because the data were not normally distributed, this test was chosen to measure the significance of differences in scores for paired data.

The test statistic showed a Z-value of -6.741 with a p-value of 0.0001. A p-value <0.05 indicates a highly statistically significant difference between pre- and post-intervention scores. In other words, the null hypothesis stating no difference in scores before and after education can be rejected.

Of the 60 students, 59 had higher scores after the education (positive ranks), 1 student had no change in score (ties), and no students had a decrease in score (negative ranks). This confirms that the majority of students directly benefited from the use of the "isi piringku" (my plate mockup) as a learning tool.

DISCUSSION

The significant increase in students' nutritional knowledge following an educational intervention using the "Isi Piringku" (My Plate) model demonstrates that visual learning media has a positive impact on the transfer of health information. This media not only captures students' attention but also helps concretize the abstract concept of balanced nutrition, making it easier to understand and remember (Widyastuti & Mulyani, 2020).

The results of this study align with cognitive learning theory, which states that the use of visual aids can improve information absorption and knowledge retention (Piaget, 2002). The hands-on experience of arranging food pieces in the correct proportions stimulates students' cognitive and affective aspects, making learning more meaningful and contextual. In the context of public health education, a visual media-based Communication, Information, and Education (IEC) approach has proven effective in changing knowledge and behavior. In addition to improving understanding, this intervention has the potential to raise awareness of the importance of balanced nutrition in everyday life. This increased knowledge is expected to improve students' food consumption behavior, thus having a long-term impact on preventing nutritional problems such as anemia, obesity, and stunting (Damayanti et al., 2018).

This research also indicates the importance of innovation in educational media in schools, particularly for health topics that are often considered boring when presented conventionally. Therefore, teachers and healthcare workers are advised to adopt interactive educational media such as the "fill my plate" model in their learning programs (Ramadani & Zulkarnain, 2021).

The increase in average nutrition knowledge scores after education using mock-ups indicates the effectiveness of the intervention as a learning tool. The mock-ups provide a visual and concrete illustration of the concept of a balanced plate, which is difficult to grasp through lectures or theory alone. This aligns with previous research (Putri et al., 2021), which demonstrated that interactive visual learning media can improve students' understanding of nutrition and healthy eating patterns.

The normality test, which showed the data were not normally distributed, supported the selection of the Wilcoxon test for data analysis, which did show significant results. This confirms that the changes in learning outcomes were not coincidental but a real effect of the education using the model media. Research by Agustina & Rahman (2019) also supports these findings by demonstrating the effectiveness of interactive learning media in improving students' nutritional knowledge.

In addition to enhancing knowledge, the interactive use of mock-ups can stimulate student motivation and active engagement in the learning process. This is crucial for developing a deeper understanding that can be applied to everyday behavior related to healthy eating, making this type of educational program potentially beneficial for long-term positive changes in students' nutritional habits.

CONCLUSION

Based on the research results, it can be concluded that education using the "fill my plate" model media significantly increases the nutritional knowledge of students at SMP Negeri 1. Deli Tua, as indicated by a significant increase in posttest scores compared to pretest and Wilcoxon test results, this intervention is effective as a learning medium that can provide a more realistic and interactive understanding of the concept of a balanced plate, thus potentially encouraging positive changes in students' nutritional behavior.

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