

THE EFFECTIVENESS OF PUZZLE MEDIA ON THE KNOWLEDGE AND ATTITUDES OF ELEMENTARY SCHOOL CHILDREN

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ABSTRACT

School-aged children are the nation's investment, who are the successors of development in Indonesia. The nutritional needs of school children based on the nutritional adequacy rate are 1850–2100 kcal. These nutritional needs include breakfast. Breakfast contributes around a quarter to a third of daily nutritional needs, namely around 400-600 calories. Based on Basic Health Research in 2018, 10% of school age children consumed breakfast with an energy intake of 30% and 26% of children consumed low quality breakfast, such as water, milk or tea.

The aim of this study was to assess the effectiveness of puzzle media on knowledge and attitudes about breakfast frequency before and after the intervention.

This research was conducted at Ash-Sholihah Islamic Elementary School. The type of research is Quasi Intervention Design with a pre-test and post-test research design. The population in this study were 55 students at class VI. Sample was total population. The research was carried out with counseling using puzzle media for 40 minutes. Pre-test was carried out before the counseling and a post-test was carried out 10 days after the counseling.

The results of the research are the availability of educational media, namely a puzzle game about breakfast which consists of two parts, namely the benefits of breakfast and the portion of breakfast. The average knowledge of respondents about breakfast at the pre-test was 20.27 and the post-test results were 26.58 points. The average breakfast attitude score in the pre-test was 15.65 and the post-test result was 18.24 points. Based on statistical tests using the independent-sample t-test, it shows a probability value of $p = 0.001$. It can be concluded that on average there is a real difference in the knowledge and breakfast attitudes of respondents before and after the counseling. Through this research, we can found an interesting and fun education to increase the knowledge of children.

Keywords : *Effectiveness, puzzle, knowledge, attitudes, breakfast*

INTRODUCTION

School-age children are an investment for the nation, later they will become the successors of development in Indonesia. The government must strive to improve quality in terms of both health and intelligence systematically and continuously. The growth and development of school-age children and their learning achievements require adequate nutritional intake, both in terms of quantity and quality (Mawarni, 2018).

Currently, it is very important for children to experience good growth and development so that their nutritional status is in a state that is not worrying because children are the hope of the future, therefore they need to be prepared so that in the future they will become quality, healthy, moral and useful human resources for the nation. Increasing the level of public health is very necessary to fulfill the development carried out by the Indonesian nation (Lasidi, 2018). One of the health efforts is to improve nutrition, especially at school age, especially at ages 6-13 years (Harianti, 2013).

For school children, nutritional needs are guided by balanced nutrition, including 50-60% carbohydrate needs, 14% protein and 25% fat, these nutritional needs include breakfast. Breakfast contributes around a quarter to a third of daily nutritional needs, namely around 400-600 calories, depending on the composition and quantity (Gede, 2016).

Based on WHO recommendations, a good breakfast that meets nutritional criteria is a breakfast that supplies carbohydrates (55-66%), protein (12-15%), fat (24-30%) and the amount of energy is around 370-555 kcal and protein is around 9.8-14.7 grams. By getting used to eating breakfast, you can maintain your body's endurance, increase your physical endurance and physical condition to stay in top shape, improve your physical fitness and concentration which can make it easier to absorb information.

In a study of 133 elementary school students in Philadelphia and Baltimore, the results showed that children who used to eat breakfast had large improvements in their study scores, compared to children who rarely ate breakfast. Breakfast is useful for increasing students' learning concentration so that students can easily understand the lessons given by their teacher (Dear, 2017).

Breakfast can provide the nutrients the body needs, including macronutrients, namely carbohydrates, protein and fat. These nutrients produce energy, increase growth and play a role in metabolism. Apart from that, it plays a role in the brain's work functions by providing glucose levels for the brain, as well as as an active means of transportation for the brain (Sunarto, 2019).

Based on Basic Health Research in 2018, 10% of school age children consumed breakfast with an energy intake of 30% and 26% of children consumed low quality breakfast, such as water, milk or tea. This fact shows that not everyone has the habit of having a good quality breakfast (Khalida, 2013 in Wulandari, et al. 2018).

Research on nutrition education using puzzle games was conducted on school children in Kaliwungu District, Semarang Regency (Mardiana, 2015). From the results of research on 100 students, it was found that student knowledge increased by 58%. This is in line with Nasution's (2020) research on the use of puzzles with the theme of balanced nutrition as a promotional effort for students at SD Pratiwi, Makassar. Data analysis shows that there is an increase in knowledge, attitudes and actions after the intervention with puzzles was carried out.

In Ricvan's research (2017) counseling using visual media about a healthy breakfast was able to influence a person's behavior in eating breakfast. Puzzle games are an alternative media in nutrition education for elementary school children. Puzzle is a game of arranging images from pieces into one complete image. The puzzle game used in this research consists of pictures of the arrangement and portions as well as the benefits of breakfast

METHOD

This research was conducted at Ash Sholihah Islamic Elementary School located on Jalan Eka Bakti Gang Bonsai No. 47-A Gedung Johor Village, Medan District, Johor, Medan City. The time of the research was carried out from March to September 2022. This type of research was quasi intervention design with a pre-test and post-test research design. Pre-test is carried out before intervention. The post-test was carried out 10 days after the intervention. According to Brigham in Azwar (2005), the sleeper effect concept states that people will still remember the contents of the message delivered with which amount to 55% in 10-14 days after the message was delivered.

The population in this study were all grade VI students, and the sample in this study was all grade VI students at the elementary school which amounts to 55 person. Requirements to become a sample or research respondent with the following criteria:

- a. Students can read and write well and correctly
- b. Students are able to communicate well
- c. Students are present at all stages of research activities.

The data in this study include knowledge and attitudes about breakfast before and after the intervention. The research implementation stages started with a pre-test to determine students' knowledge and attitudes about breakfast. Next, the first intervention was given in the form of counseling about breakfast. Counseling is carried out by researchers at class VI about 40 minutes. Counseling only did before first intervention. After the counseling finished, researchers taught

the students about playing puzzle. the main theme of the puzzle is about breakfast. The puzzle shows the benefits of breakfast, the recommended menu for breakfast and the nutritional content of food and drinks on the breakfast menu. The puzzle is made of thick paper measuring 20 x 30 cm. The paper puzzle pieces display attractive images and messages and are brightly colored so they attract children's attention. All the content of puzzle created by the researcher. Students played the puzzle for approximately 30 minutes. Three days later, a second intervention was carried out with only puzzle media. Then three days later, did third intervention with puzzle media. Finally, three days later, a post-test was carried out to assess the respondents' knowledge, attitudes and breakfast habits.

Respondents' knowledge and attitudes were measured through a questionnaire adopted from research on the effect of nutritional education on changes in breakfast behavior (Ricvan, 2017). The questionnaire contains 10 questions about breakfast knowledge and 10 questions about respondents' attitudes towards breakfast. The correct answer is given a score of 1 and the wrong answer is given a score of 0. To get the final score, it is obtained by dividing the number of correct scores by the total number of questions and multiplying by 100%. Data analysis was carried out using the dependent t-test.

RESULTS AND DISCUSSION

The respondents in this study were all class VI students at Ash-Sholihah Islamic Elementary School in 2022. The following are the characteristics of the respondents based on gender, age, parents' occupation.

Table 1 Respondents Characteristic Based on Sex, Age, Occupation of Father and Mother

Sex	n	%
Male	35	63,6
Female	20	36,4
Total	55	100
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10 years old	10	18,2
11 years old	36	65,5
12 years old	8	14,5

13 years old	1	1,8
Total	55	100
Father Occupation		
Labour	2	3.6
Online driver	5	9.1
Teacher	3	5.5
Private Sector Employee	7	12.7
Trader	7	12.7
Government Employee	3	5.5
Security	2	3.6
Breeder	1	1.8
Construction Worker	10	18.2
Self Employee	15	27.3
Total	55	100
Mother Occupation		
Working Mother	21	38,2
Housewife	34	61,8
Total	55	100

Based on the table above, we can see that 63.6% of the respondents were male and 36.4% were female. The majority of respondents were 11 years old (65.5%), followed by those aged 10 years (18.2%), then those aged 12 years (14.5%). Meanwhile, the oldest is 13 years old (1.8%). The majority of respondents' father occupations were working as self employee (27.3%), construction workers (18.2%), working as private sector employees and traders (12.7%), online drivers (9.1%) and as government employee and teachers, each with 5.5%, security and labours with 3.6% each and livestock breeders with 1.8%. The occupation of the respondents' mothers is 38.2% of working mothers and 61.8% of housewife.

Based on the pre-test results (before counseling was carried out), it was found that the average total knowledge score about breakfast was 20.27 and the results during the post-test (after counseling) were 26.58. The results of the analysis using the independent sample t-test show a probability value (p) = 0.001 and $t = -19.664$, so it can be concluded that on average there is a real

difference in respondents' knowledge during the pre-test and post-test with an average difference average score 6.31. From the results of the statistical tests carried out, it can be seen that there was an increase in respondents' knowledge of 6.31 points after counseling about breakfast using puzzle media.

Table 4.6 Average Comparison Pretest and Posttest Score Values for Breakfast Knowledge in Ash-Sholihah Islamic Elementary School Students

	Respondents Knowledge About Breakfast				
	Mean	SD	t	p	Average Comparison
Before Intervention	20,27	2.147	-19,664	0,001	6,31
After Intervention	26,58	1.812			

This is in line with research by Oktaviani (2019) which states that the influence of playing puzzle games can increase respondents' knowledge about balanced nutrition in Class IV students at SD Negeri 001 Samarinda Seberang.

The knowledge tested in this research is knowledge about breakfast which is visualized through a puzzle. The message in the puzzle consists of the benefits and portions of breakfast which are equipped with pictures and narration. Measurement of children's knowledge regarding the benefits and portions of breakfast in this study was carried out using tests. It was found that the students' post-test results were higher in score than the pre-test results. From the results of the statistical tests carried out, it can be seen that there was an increase in respondents' knowledge of 6.31 points after counseling about breakfast using puzzle media.

Changes and increases in the value of knowledge among respondents are possible because of various things related to the nutrition education process, including the material being packaged in attractive media in the form of puzzles, so that it is easy for respondents to understand the material presented.

Puzzle media is a means used to convey messages or information by connecting one part to another to form an image. Media is used as a tool in health promotion. Puzzle as a medium in the form of images divided into image pieces, aims to be able to hone the power of the mind, exercise, patience, and know the ability to share. Apart from that, puzzle media can also be called an educational show because it not only allows you to play but also sharpens your brain and trains your mind and

hand dexterity (Laili, 2018). Playing puzzles has the benefit of developing children's skills in solving problems (Elfanany, 2013).

Puzzles increase children's curiosity, being an effective tool for informing or evaluating children's knowledge through pictures. Through puzzle media, children will learn to investigate a problem by identifying clues based on existing image pieces, such as shape, color, texture, then considering their exact position. The media can be seen, heard, touched, smelled or tasted to facilitate communication and delivery information about health. Changes in nutritional knowledge in elementary school children are a change in the level of knowledge in a better direction than before. It is hoped that changes in nutritional knowledge can provide changes in children's attitudes and behavior in an effort to improve nutrition. Children can regularly have breakfast before going to school and know what their body needs.

Health promotion efforts can be carried out using various methods and media tailored to the target. An effective way to approach a group is with the lecture method. In the lecture method, a process of behavior change in the desired direction can occur, changes in nutritional knowledge through the active role of targets and exchanging experiences with fellow targets.

Based on the pretest results (before counseling was carried out), it was found that the average total attitude score regarding breakfast was 15.65 and the results during the posttest (after counseling) were 18.24. The results of the analysis using the independent sample t-test show a probability value (p) = 0.001 and $t = -13.214$, so it can be concluded that on average there is a real difference in the respondents' attitudes during the pretest and posttest with an average score difference of 2.59. From the results of the statistical tests carried out, it can be seen that there was an increase in respondents' attitudes by 2.59 points after counseling about breakfast using puzzle media.

Table 3 Avarage Comparison Pretest and Posttest Score Values for Breakfast Attitudes in Ash-Sholihah Islamic Elementary School Students

	Respondents Attitudes About Breakfast				
	Mean	SD	t	p	Avarage Comparison
Before Intervention	15,65	1.556	-13,214	0,001	2,59

After Intervention	18,24	1.374			
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The results of this research are in accordance with the results of research conducted at Elementary School 06 Poasia which shows that there is an influence of puzzle promotional media about balanced nutrition on students' attitudes, namely that there is an increase in attitudes before and after being given guidance with nutritional puzzle promotional media (Hikmawati, 2016). The results of other research show that there is an influence of promotional interventions for eating fish using puzzle media in building positive attitudes in school-aged children towards fish consumption. After the promotional intervention for liking to eat fish using puzzle media, as many as 98.1% of subjects showed an attitude of liking to eat fish (Prameswari, 2018). The formation of a person's attitude is influenced by several factors, including personal experience, culture, other people who are considered important, mass media, educational and religious institutions and emotional factors within oneself. The increase in attitudes that occurred among respondents was possibly caused by the knowledge gained which was able to give rise to understanding and confidence in their needs as respondents who must have behavior (knowledge, attitudes and actions) regarding breakfast. Apart from that, the change in respondents' attitudes after the intervention was carried out because the nutritional puzzle promotional media used was easy to understand and fun, not only increasing knowledge but also influencing respondents' attitudes and motivating them to adopt a balanced diet. Therefore, it can be concluded that there is an influence of education using nutritional puzzle promotional media on respondents' attitudes about the importance of breakfast.

Someone who has good knowledge does not guarantee that they will have a positive attitude. The individual concerned must be able to absorb, process and understand the information received as stimulus. The positive attitude meant by the researcher is that the respondent has an opinion that meets the researcher's criteria, namely that the respondent believes in the importance of balanced nutrition and maintaining a balanced diet. Respondents who still had negative attitudes at the end of the research could be because their interpretation of the attitude questions was inaccurate.

Providing health education using puzzle media to respondents was able to increase children's knowledge about the benefits and portions of breakfast. Knowledge about breakfast that children have will then stimulate children to become aware of the importance of breakfast. After children realize the stimulus they get through puzzle media, children will start to try it and apply it in their

daily lives. Therefore, it is important for children to be given health education using puzzle media so that their attitude towards consuming breakfast becomes better.

Breakfast behavior among school students may be influenced by the mother's job, father's job and the unavailability of breakfast at home. The results of research at SD Kemiling Permai Village show that there is no relationship between mother's work, father's education, and mother's education with the breakfast behavior of elementary school children in Kemiling Permai Village, Kemiling District, Bandar Lampung City in 2013. The most dominant factor is related to children's breakfast behavior. Elementary School in Kemiling Permai Village, Kemiling District, Bandar Lampung City is the availability of breakfast food at home, apart from the availability of breakfast food at home, pocket money at school also influences children to eat breakfast at home.

Providing health education using puzzle media to elementary school children can increase children's knowledge about the importance of breakfast and the portion they should eat every morning. Knowledge about the benefits of breakfast and the breakfast portions that children have will stimulate children to become aware of the importance of breakfast. Children's awareness of the importance of breakfast makes children interested and consider the stimulus. After the child considers the stimulus, the child will start to try it and apply it in his daily life. Apart from that, active activities in playing puzzles can also increase the activity of children's brain cells so that children are able to remember what they did on the puzzle.

CONCLUSION

1. The average total knowledge of respondents about breakfast during the pre-test (before counseling) was 20.27 and the results during the post-test (after counseling) were 26.58 and there was an increase of 6.31 points. Based on statistical tests using the independent sample t-test, it shows a probability value (p) = 0.001 and $t = -19.664$, it can be concluded that on average there is a real difference in respondents' knowledge during the pre-test and post-test.
2. The average total attitude score regarding breakfast during the pre-test (before counseling) was 15.65 and the results during the post-test (after counseling) were 18.24, and there was an increase of 2.59 points. Based on statistical tests using the independent sample t-test, it shows a probability value (p) = 0.001 and $t = -13.214$, it can be concluded that on average there is a real difference in the respondents' attitudes during the pre-test and post-test.

3. Education using puzzle media can be used as an alternative to increase children's knowledge. However, as technology advances, manual puzzle games are becoming less popular with children. Because the game design is not mobile and the puzzle theme is difficult to change. For this reason, in future research the puzzle expected to be transform into a digital puzzle. The messages and images in the puzzle can be changed quickly according to the educational information the researcher wants to convey. Puzzles can also be played anytime and anywhere with free game access.

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