



THE EFFECT OF FLASHCARD EDUCATION ON NUTRITIONAL KNOWLEDGE CHANGES IN STUDENTS IN SDN 013 SEKUPANG

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ABSTRACT

It is critical for school children to have strong nutrition knowledge in order to avoid nutrition problems. To increase the nutrition knowledge, some nutrition education should be given to the school children. Children at school age have the characteristics of preferring to play, move, do teamwork, and experience an event directly. Through a game can make someone more relaxed and happier besides that the game can also be a tool to learn something. The purpose of this study is to find out the effectivity of flashcard as a media education for Pedoman Gizi Seimbang for students at SDN 013 Sekupang. The method of this study is quasi experiment with pretest- posttest control group design. The total of respondents is 62 people with 31 respondents per each experiment group and control group. The intervention was last for about 30 minutes by playing a game using the flashcard for the experiment group and using leaflet for the control group, and was carried out 2 times in a week. The data was analyzed with wilcoxon test and mann whitney test. The result is there is any difference of the average between before and after the intervention in experiment group and control group ($p = 0.000$ for experiment group) and ($p = 0.021$ for the control group). Based on wilcoxon test and mann whitney test result we can conclude that the usage of flashcard is more effective than using leaflet media to increase the knowledge of Pedoman Gizi Seimbang for student in SDN 013 Sekupang. The public health center in Sekupang expected to use flashcard as a media for the nutrition education.

Keywords: flashcard; media education; nutrition education; nutrition knowledge

Introduction

The school-age children group is included in the nutritionally vulnerable group with a relatively quick growth and development process, because school-age children need relatively many nutrients¹. Knowledge is one of the factors that affects a person's conduct. If a person has sound knowledge of nutrition, their actions and behaviors connected to nutrition will be advantageous². Children at school age require more nutrients and energy than toddlers. As children at this age grow rapidly and engage in more activities, they need extra energy, protein, calcium, fluoride and iron. Children can eat up to five times a day to meet their nutritional and energy needs. However, it should still be emphasized to children that they should consume three healthy meals a day-breakfast, lunch and dinner³.

Based on national Riskesdas data in 2018, the prevalence based on IMT / U of children aged 5-12 years in Kepulauan Riau was very thin at 3.3%, thin at 7.1%, fat at 10.5%, and very fat or obese at 12.3%. Kepulauan Riau ranked third with the highest prevalence of obesity after Papua at

15.3% and the Special Capital Region of Jakarta at 14%. According to the 2018 Kepulauan Riau Riskesdas, the prevalence of nutritional status based on IMT/U in Batam was very thin at 4.17%, thin at 7.20%, fat at 9.82%, and very fat or obese at 13.75%, and Batam ranked first with the highest prevalence of obesity in the Kepulauan Riau⁴.

Health education is the process of modifying health behaviors in people, organizations, or communities to maintain and improve health through self-awareness. One-time education cannot maintain nutrition knowledge. Education must be systematic, that is, learning techniques through teaching material incrementally at regular times and intervals, meaning that nutrition education must be incremental not one-time⁵. The more people learn about nutrition, the more motivated they are to consider the type and quality of food they eat. Nutrition education can help improve this. This is done to increase nutritional awareness and change habits associated with poor eating habits. Good nutrition is also influenced by good cooking⁶.

Learning strategies with flash cards have a significant impact on the acceptance of knowledge, flash cards can also be used as media in games⁷. Based on the results of research conducted by Wahyuningsih, et al, there were significant differences in knowledge after providing nutrition education interventions using nutrition card media⁸.

Nutrition education conducted on elementary school students in Cilincing subdistrict using the balanced nutrition tumpeng puzzle story method proved to be quite effective in improving elementary school children's understanding of balanced nutrition⁹. The use of nutrition education media with flashcards media is quite effective with the target of elementary school children¹⁰. Health education through flashcards influences primary school children's attitudes and knowledge about eating a nutritionally balanced diet¹¹.

Based on the results of the early survey, balanced nutrition counseling has never been conducted at SDN 013 Sekupang, the health centre usually only conducts dental and ENT examinations. The distance between Puskesmas Sekupang and SDN 013 Sekupang is 11.4 KM and is the most distant elementary school in the working area of Puskesmas Sekupang. Based on this background, the researcher was motivated to examine the effectiveness of education on balanced nutrition guidelines using flashcards at SDN 013 Sekupang. The study was held on grade 5 elementary school children, because grade 5 elementary school children have cognitive development in the form of formal thinking ability and the required task load is not as big as grade 6 elementary school, they are considered to be able to complete the questionnaire and facilitate research¹².

Methods

This research is a quantitative study using a quasi-experimental design. The experimental design of this research is a pre- and post-test non-equivalent control group design. Measurements

were taken twice in each group, namely before and after the intervention. The sample in this study was 62 respondents, with 31 respondents for the control group and 31 respondents for the experimental group. The inclusion criteria in this study were that the respondents were grade 5 students at SDN 013 Sekupang and were present when the research took place. While the exclusion criteria in this study were, respondents did not participate in the study from start to finish and gained knowledge from outside. This study is based on baseline data collected from questionnaires filled out by respondents. The data obtained were the respondent's identity, name, age, gender, class, and knowledge of balanced nutrition guidelines. The intervention was conducted twice, on 22 February and 25 February 2023 at SDN 013 Sekupang. The tools used for data collection in this study are questionnaires and flashcard media totaling 16 cards and leaflets containing the definition of balanced nutrition guidelines, principles of balanced nutrition guidelines, special messages for balanced nutrition for school-age children and the contents of piringku. The test used was the Wilcoxon test to compare pretest and posttest values in the experimental group and control group. The mann whitney test was conducted to compare the effectiveness of the intervention using flashcards or leaflets.

Results

1. Average Difference in Nutrition Knowledge Before and After Intervention

Table 1. Rank pada Uji Wilcoxon

Group		N	Mean rank	Sum of ranks
Experiment	Negative ranks	0	0.00	0.00
	Positive ranks	31	16.00	496.00
	Ties	0		
Control	Negative ranks	5	11.30	56.50
	Positive ranks	17	11.56	196.5
	Ties	9		

In the experimental group, positive ranks were obtained for 31 respondents with an average rank of 16.00, and there were no respondents who experienced negative ranks and ties, which means that there were no respondents who experienced a decrease in posttest scores and got the same pretest and posttest scores. In the control group, the results obtained negative ranks in 5 respondents with an average rank of 11.30, positive ranks in 17 respondents with an average rank of 11.65, and ties in 9 respondents.

**Table 2. Average Difference in Nutrition Knowledge
Before and After Intervention**

Group		N	Mean ± SD	p
Experiment Group	Pre test	31	76.55 ± 5.732	0.000
	Post test	31	89.87 ± 4.653	
Control Group	Pre test	31	77.52 ± 7.023	0.021
	Post test	31	81.00 ± 5.138	

Based on table 2, the results obtained are the significance value in the experimental group of $p = 0.000$, meaning that there is a difference in the average knowledge of balanced nutrition of respondents after giving intervention with flashcard media in the experimental group. While in the control group the results obtained a significance value of $p = 0.021$, which means there is a difference in the average knowledge of balanced nutrition after giving intervention with leaflet media to respondents in the control group.

2. Average Difference in Nutrition Knowledge After Intervention with Flashcard and Leaflet Media

Table 3. Rank in Uji Mann Whitney

Group	N	Mean rank	Sum of ranks
Experiment	31	43.48	1348.00
Control	31	19.52	605.00

The results of using flashcard media are better than leaflet media, as in table 3 the mean rank of the experimental group is higher at 43.48 and the control group is 19.52.

Table 4. Average Difference in Nutrition Knowledge with Flashcard and Leaflet Media

Group	N	Mean	p
Experiment Group	31	43.48	0.000
Control Group	31	19.52	

Based on table 4, the significance result is $p = 0.000$, which means there is a significant difference between providing education using flashcards and leaflet media.

These results prove that flashcard media has a good impact on the experimental group because there is an increase in the level of nutritional knowledge of respondents, seen in the mean rank value in the experimental group increased higher than in the control group. So it can be concluded that the use of flashcard media is more effective than leaflet media.

Discussion

School-age children should be taught about a balanced diet from an early age. This understanding can help prevent various eating disorders in school-age children. As children grow and develop at this age, the nutritional needs of school-age children are often greater than those of children below school age. In addition, school-age children are in their active period, where they are more active outside the home, and often forget when it is time to eat¹³. Therefore, education is needed for school-age children.

With certain learning methods that require tools and media, learning without these tools and media will not achieve maximum results¹⁴. The average knowledge of respondents before the intervention was still found at a moderate level of knowledge, but after the intervention the level of knowledge was reduced in the control group, even in the experimental group there were no respondents with a moderate level of knowledge. The increase in the level of nutritional knowledge occurred due to the provision of education using media that increased respondents' interest in learning.

The level of knowledge can be divided into good knowledge (with a score of 76% - 100%), sufficient knowledge (with a score of 60% - 75%), and poor knowledge (with a score of 60%)¹⁵. The level of early knowledge of respondents is still found at the level of sufficient knowledge, this is due to the lack of provision of nutrition education in school-age children. The topic that was often answered incorrectly by respondents was food diversity. The number of respondents who still answered incorrectly was due to the use of words that were quite difficult for respondents to understand. The statement of diverse foods means foods that contain sources of carbohydrates, protein, and vitamins in the questionnaire should be changed to examples of diverse foods, namely consuming rice with fish, tempe and spinach vegetables. Because by using direct parable sentences it will be easier for respondents who are school-age children to understand.

Learning without these tools and media will not achieve maximum results¹⁶. The average knowledge of respondents before the intervention was still found at a moderate level of knowledge, but after the intervention the level of knowledge was reduced in the control group, even in the experimental group there were no respondents with a moderate level of knowledge. The increase in the level of nutritional knowledge occurred due to the provision of education using media that increased respondents' interest in learning.

Based on research conducted by Oktaviani et.al, providing education using flashcards can increase knowledge, obtained an average pre-test value of 42.40 and an average post-test value of 80.40¹⁷. Another study conducted by Lisa showed an increase in the level of knowledge after education using flashcards, obtained an average pre-test value of 67 and an average post-test value of 78¹⁸.

The benefits of flashcard media include practical, affordable, easy to carry, and fun because it can be used to learn while playing, with the terms on flashcards are common vocabulary, so students can easily understand and can memorize them¹⁹. The use of flashcards is more attractive to respondents because there are pictures and the content of the message on the card is shorter than the leaflet media which contains more writing so that respondents are more easily bored reading the entire message contained in the leaflet. Students are more easily bored because they learn only by reading and learning independently²⁰. In accordance with research conducted by Selviyanti et.al the use of flashcard educational media is more effective than using leaflet media²¹.

Through a game, it can make someone more relaxed and happier, besides that games can also be a tool to learn something²². The increase in the level of knowledge of these respondents is in line with research conducted by Oktavia and Agustin²³.

Providing education with flashcard media, respondents play a game in groups so that respondents simulate with other respondents, play a role, and do something real, so generally respondents will remember and understand the activities they do as much as 90%. In the research of Wijayanti et.al providing education with snakes and ladders educational games is more effective in increasing respondents' knowledge²⁴.

This study contradicts research conducted by Darsad on improving learning outcomes in the 2018/2019 academic year of 5th grade students at SDN Sewar in science subjects regarding the digestive system in humans using leaflet media, which proved that leaflet media can significantly improve learning outcomes²⁵.

Conclusion

The level of knowledge of respondents increased after the intervention, in the experimental group there were no respondents with a sufficient level of knowledge while in the control group there were still respondents with a sufficient level of knowledge. This proves that the use of flashcard educational media is more effective for increasing balanced nutrition knowledge in students at SDN 013 Sekupang compared to using leaflet media.

It is hoped that flashcard educational media can be used as an alternative to nutrition education media that can be used for school-age children. For further researchers, it is recommended to use simple sentences and intervene more than twice so that the results obtained are more significant.

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Conflict of Interest:

There is no conflict of interest in this research.

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