

The Differences Between The Effects Of Giving Nutritional Lessons Using Animation Media And Lectures On Primary School Age Children's Nutritional Knowledge, Attitudes, And Behaviors Of Fruits And Vegetables Consumption

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Abstract, Consuming enough fruits and vegetables is one of balanced nutrition indicators. Children already have a positive perception of fruits and vegetables, but their eating behaviors still do not meet the standards, or have only functioned as supplements. Giving nutritional lessons is one way to increase knowledge, attitudes, and behaviors of fruits and vegetable consumption. This study aims to analyze the differences between the effects of giving nutritional lessons using animation media and lecture on primary school age children's nutritional knowledge, attitudes and behaviors of fruits and vegetable consumption. This research was a quasi experimental using pre-experimental design (pre-post test with control group design). The subjects were the third grade students enrolled in 4 state primary schools, locating in the district town of Kediri, East Java. A total of 92 students was taken by cluster random sampling. Data collection techniques were directly interviewed, and questionnaires related to children's nutritional knowledge, attitudes, and behaviors of fruit and vegetable consumption. Data were analyzed using independent t-test analysis with level significance 95%. The sample was 51 girls (55,44%) and 41 boys (44,66%). The result of this study showed that there was a significantly different effect on primary school age children's nutritional knowledge before being given nutritional lessons by using animation media and lectures ($p = 0.000$), there was no significantly different effect on primary school age children's nutritional knowledge after being given nutritional lessons by using animation media and lectures ($p = 0.397$). There was no significantly different effect between primary school age children's nutritional attitudes before ($p = 0.160$) and after being given nutritional lessons by using animation media and lectures ($p = 0.689$). There was significantly different effect between primary school age children's behaviors of fruits and vegetable consumption before ($p = 0,029$) and after being given nutritional lessons by using animation media and lectures ($p = 0,046$).

Key-words : *nutrition, children, animation media*

1. Introduction

Nutrition is one of the determining factors of human resources quality. A nutritional problem vulnerable occurs in all age groups, especially babies and children who are experiencing the growth period. Children's nutritional problems are the impact of the imbalance between the intake and exodus nutrients (*nutritional imbalance*) in chronic disease, overweight body, allergy and malnutrition [1]. The health of children cannot be separated from the understanding of health in general which covers the health of the body, spiritual and social. The health of children who are formed will always be followed by their growth and development, for example the development of the fed. Children begin to understand that nutritious foods are very useful for health and growth. This understanding can be achieved through the process of nutritional education [2]. The introduction of nutritional education in schools means giving the matter of nutrition or nutritional lessons formally during the teaching and learning process at school to the students. The success of the process requires good communications [3].

The results of Riskesdas (2010) illustrated that the consumption of vegetables and fruits in the older age above ten years is still low that are 36,7 % and 37,9 % for each one [4]. The results of Riskesdas (2013) showed the prevalence data of less consumption of vegetables and fruit to age groups above ten years reached till 93.5 %, while for East Java showed the prevalence of nearly 90% [5].

The National Diet and Nutrition Survey United Kingdom (2009) stated that the intake of vegetables and fruit on children in the age of 11 - 18 years are still low (around 3 portions / day). Only 7.2 % for girls and 22,1 % of boys who reached the recommendations of > 5 times a day. The level of fiber intake lower than the recommended number (average intake 18 g a day), the average of girls 10.6 g/day lower than the average of boys 12.2 g/day [6]. Children have a positive perception of the fruit and vegetables, but the behavior of children's eating is still not fulfilling the standard. Eating fruit and vegetables are limited as a complement only not as a balanced menu [7].

Fruit and vegetable consumption is an important component of health. Consuming enough of fruit and vegetables is one of the indicator balanced nutrition for vegetables and fruits is sources of vitamins, minerals and dietary fiber food which acts as an antioxidant, source of fructose and glucose, maintain normality in blood pressure, blood sugar, a risk of difficult constipation and obesity. Permenkes RI No. 75, 2013 about the Nutrition Sufficiency Rate which is recommended for the Indonesian people, regulate sufficiency fiber rate for children in 7 - 9 years of 26 gram/day by urging the consumption of fruit and vegetables for children in 7 - 9 years of both boy and girl that is equal to 3 portions. One portion of vegetables equal to 100 grams or 25 kcal while 1 portions of fruit equivalent with 50 grams or 50 kcal [8]. Nutritional education which is given to the child will have an impact on the opened mind and received knowledge becomes the basis for the habit of a good diet [3]. The average of knowledge scores of the primary school children in Depok City of 67,81 points, while in the towns and villages of Banten showed the average of nutrition knowledge scores of school aged children in a row of 69,57 points and 70,65 points. It showed that the knowledge of nutrition for children in several areas in Indonesia is still low [9].

Nutritional education efforts will be successful in accordance with the expected purpose if it is supported with appropriate aids, to clarify the message and improve effectiveness of nutrition education process [10]. So far nutritional education that is often applied to children has been using teaching aids such as posters and leaflets. The film is one of the effective viewers. Television, video recordings, and VCD (video *compact disc*) are tools that are many used to conduct of the nutrition education [11]. Children spent much time in front of electronic media so that affects the behavior of children, including the eating pattern [12]. Research of Safriana (2012) showed that 64 % of primary school children admitted that they are affected by electronic media (television) as advertising media and showed the sense of the relationship between the influences of the media with the behavior of selecting snacks in primary school children. Research results from Nurmasita (2013) mentioned that the cartoon films as media can improve the child's understanding on the importance of the fruit and vegetable consumption of the elementary school students at Tulungrejo 04 Tulungrejo district, Bumiaji sub-district of Batu city, East Java. Colors and pictures can improve the child's motivation in receiving messages. The cartoon media use the development of technology to increase the knowledge that is expected to facilitate the dissemination of information. The purpose of this research is to analyze the difference between the influence of nutritional lessons using animation media and lectures toward nutritional knowledge, the attitudes and behavior of the consumption of fruit and vegetables to primary school children [13].

2. Research Method

2.1. Type and Research Design

This research is *quasi experimental research* using the design of the *pre-experimental (pre-post test with control group design)* to analyze the different impact of nutritional lessons using animation media and lecturing method against the nutritional knowledge, the attitudes and behavior of fruit and vegetable consumption.

2.2. Place and Time

This research was conducted in A accredited Elementary School of Sub district in Kediri City, East Java consisting of SDN Banjaran IV, SDN Ngadirejo I, SDN Semampir I and SDN Dandangan II and be held in April - May 2015.

2.3. Population and Subject

The population in this subject, research is a cross for entire 3rd grade students who are enrolled in A accredited Elementary School in a sub-district in Kediri City, East Java, and 2014/2015 school year as many of 784 students from 20 schools. The sample as many of 92 the students from four Elementary Schools they are SDN Banjaran IV, SDN Ngadirejo I, SDN Semampir I and SDN Dandangan II in districts of the city in Kediri City, East Java.

A sample large calculation used, the amount of the population, according to Lemeshow (1990 in Murti, 2013), [14]:

$$n = \frac{N \cdot Z^2 \cdot 1 - \alpha / 2 \cdot p \cdot q}{d^2 (N - 1) + Z^2 \cdot 1 - \alpha / 2 \cdot p \cdot q}$$

- n = sample size
- Z_{1- α/2} = 1.96 on α 0.05
- P = Reported prevalence proportion (6.5 %) appropriate to the proportion of the consumption adequacy level of fruit and vegetables prevalence (result collected Riskesdas, 2013).
- q = 1 - p
- d = Specified precise (0.05)
- N = large population of students in 3rd grade at The Elementary School (784 students)

$$n = \frac{784 (1,96^2) \times 0,065 \times 0,935}{(0,05)^2 \cdot 783 + (1,96)^2 \times 0,065 \times 0,935}$$

$$n = 83,47 \quad \text{rounded become 84 students}$$

Loss of follow up 10 percent so that the total samples amounted of 92 students.

2.4. Data Collection Technique

This research divided into 2 samples they are treatment group which is a group that used a movie media or animation, video entitled "*suka buah dan sayur*" with 12 minutes duration about the benefits of fruit and vegetable consumption. Meanwhile, the control group is a group who used the lecture method. Provide nutritional lessons on the samples in the 1x/week for 1 month with the duration of 2 x 35 minutes. Performed pretest before treatment activities and post-test after the treatment.

Identifying data and characteristics, knowledge and behavior about this subject were obtained through interviews by using the structured questionnaire. The criteria determined the attitudes and behavior of the unfavorable sample have exchange score <80% and criteria good sample has exchange score \geq 80%. The criteria of a good sample of knowledge level get score >80%, and the criteria who have enough sample get an exchange rate 60-79% and criteria of lack connector has an exchange rate score <60%.

2.5. Data Analysis Techniques

The data that have been collected were being tabulated and descriptively analyzed. The analysis is used to analyze the different score of nutritional knowledge, the attitudes and behavior

of the fruit and vegetable consumption at the Elementary School students before and after treatment on each statement using a *dependent t test*. Analysis of the difference score between the knowledge of nutrition, the attitudes and behavior of fruit and vegetable consumption in the Elementary School students' treatment and control statement using *independent t test*. Statistical tests in this research used the trust level of 95 %.

3. Research Findings

The research was applied out in four Elementary Schools with an A accreditation to the 92 children in third grade in the sub district of Kediri, East Java. The subject of the research consisted of two groups, the treatment group consisted of SDN Banjaran IV and SDN Ngadirejo I as many as 46 children. The control groups are SDN Semampir I and SDN Dandangan II as many as 46 children. Group treatment gets a nutritional lesson by using animation media, while the control groups get nutritional lesson by using lectures methods.

3.1. Subject Characteristics

The distribution of the subject can be seen in table 1 and table 2.

Table 1: The Characteristics of the Subject Based On Gender

Gender	Research Group				Total	
	Treatment		Control		n	%
	n	%	n	%		
Boy	22	47,8	19	41,3	41	44,56
Girl	24	52,2	27	58,7	51	55,44
Total	46	100	46	100	92	100

(Source: Primary Data, 2015)

Table 1 shows that the distribution of the amount of girls is more than boys

Table 2: The Characteristics of the Subject Based on Age

Age (th)	Research Group				Total	
	Treatment		Control		n	%
	n	%	n	%		
8	4	8,7	6	13,0	10	10,87
9	42	91,3	40	87,0	82	89,13
Total	46	100	46	100	92	100

(Source: Primary Data, 2015)

Table 2 shows that the distributions based on age groups, the most numerous at the age of 9 years old as many as 82 children (89,13 %). In accordance with government regulations that elementary school child's third grade is compulsory for 9 years children.

3.2. The Effect of the Nutritional Lessons towards Nutritional Knowledge, Attitude and Behavior of Fruit and Vegetable Consumption

The Effect of the Nutritional Lessons towards Nutritional Knowledge, Attitude and Behavior of Fruit and Vegetable Consumption Before and After Intervention

The Treatment results measure aims to find out the score differences of nutritional knowledge, attitudes and behaviors of elementary school children against the fruit and vegetable consumption while pre-test and post-test for each group.

Table 3: The Impact of Nutritional Lessons toward Nutritional Knowledge, Attitude and Behavior before and after Intervention

Variable Research	Group	Measurement		p value
		Before	Aft	
		Mean ± SD		
Knowledge	Control	63.19±12.50	70.80±18.97	0,007*
	Treatment	54.35±13.17	67.86±13.86	0,000*
Attitude	Control	77.53±13.95	79.22±21.41	0,564
	Treatment	73.19±15.46	80.68±11.81	0,002 *
Behavior	Control	67.50±13.07	70.54±12.25	0,040*
	Treatment	74.02±14.97	75.98±13.48	0,364

Note: * significant p value (p<0.05)

(Source: Primary Data, 2015)

Table 3 shows that there is an increase in the average score of knowledge between pre-test and post-test on treatment group and the control group. The results of statistical tests on a group of treatment showed significant difference (p = 0.007). The results of statistical tests in the control group also showed a significant difference between the average score pre-test knowledge with post-test (p = 0.000).

Variable of attitude showed that there is an increase in the average score among pre-test and post-test on treatment group and the control group. The results of statistical tests on a group of treatment showed no significant difference (p = 0,564) but the control group there is a significant difference between the average score pre-test to post-test (p = 0.002).

Variables of fruit and vegetable consumption behavior in elementary school children showed an increase in average score between pre-test and post-test on treatment group and the control group. The results of statistical tests against the treatment showed significant difference (p = 0,040) but the control group there is no significant difference between the average score pre-test to post-test (p = 0.467).

3.3 The differences of the influence of nutritional lesson against nutritional knowledge, attitude and behavior of the fruit and vegetable consumption among treatment and control groups.

This measurement is intended to find out the average score comparison of nutritional knowledge, attitude and behavior of fruit and vegetable consumption before and after being given nutritional lessons on treatment and control group. A test result of differences of influence nutritional lesson against nutritional knowledge, attitude and behavior of fruit and vegetable consumption among groups of treatment with control group is presented in table 4.

Table 4: The difference of the average score of the nutritional knowledge, attitude and behavior of fruit and vegetable consumption among treatment with control group

Variable	Group						p value
	Treatment			Control			
	Average	SD	Median	Average	SD	Median	
Knowledge							
Before	63,2	12,5	64,3	54,3	13,2	50	0,001*
After	70,8	18,9	71,4	67,9	13,9	67,9	0,397
Attitude							
Before	77,5	13,9	77,9	73,2	15,5	77,9	0,160
After	79,2	21,4	77,8	80,7	11,8	77,8	0,689
Behavior							
Consumption							
Before	67,5	13,1	65	74,0	14,9	75	0,029*
After	70,5	12,3	70	75,9	13,5	75	0,046*

Note: * significant p value ($p < 0.05$)

(Source: Primary Data, 2015)

The pre-test average score knowledge of treatment group 63.2 ± 12.5 and control group 54.3 ± 13.2 . This shows that the respondent's knowledge score of treatment group higher than the control group. The results of statistical tests showed significant differences of knowledge among treatment and control group before being given the different learning methods ($p = 0.001$). While at the post-test moment showed no significant difference knowledge between treatment and control group after being given a nutritional lesson by using different learning methods ($p = 0.397$).

The pre-test average score of attitude amounted to 77.5 ± 13.9 on treatment group and 73.2 ± 15.5 in the control group. The post test average score of attitude in the treatment group of 79.2 ± 21.4 and a control group of 80.7 ± 11.8 . The results of statistical tests demonstrated the value $p > 0.05$, it means there is no significant difference between the attitude of the treatment groups ($p = 0.160$) and control group ($p = 0.689$) before being given a nutritional lesson by using different learning methods.

The pretest average score of fruit and vegetable consumption behavior of elementary school children amounted to 67.5 ± 13.1 for the treatment group and 74.0 ± 14.9 for the control group. The post test average score of fruit and vegetable consumption behavior of elementary school children in a treatment group of 70.5 ± 12.3 and 75.9 ± 13.5 of control group. The results of statistical tests demonstrated the value $p < 0.05$, it means there are significant difference against fruit and vegetable consumption behavior of elementary school children between treatment groups ($p = 0.029$) and control group ($p = 0.046$) before being given a nutritional lesson by using different learning methods.

4. Discussion

Media is a displaying messages tool to communicate to the target in order to increase the knowledge that ultimately was able to change towards positive behavior of children. The results of a communication can be found in the changes in knowledge, attitudes and [15]. The results showed an increase in the average score of knowledge between pretest and posttest on treatment group and the control group. The results of statistical tests on a treatment group showed a significant difference ($p = 0.007$). The results of statistical tests in the control group also showed a significant difference between the pretest average score knowledge with post test ($p = 0.000$). This indicates that there is an influence of the nutritional lessons of knowledge about fruit and vegetable consumption before and after intervention by using animated media. Siwi (2014) [16], state at 4th grade in SDN Seduri Sidoarjo, East Java uses the audiovisual media shows there is a difference of knowledge ($p = 0.001$) between a group of treatment with the control group. Hestidiana (2014) [17] state a trend of increased level of knowledge on elementary school children about general

guidelines balanced nutrition (PUGS) after the nutritional education undertaken by using the cartoon media with Paired test t Test ($p = 0.002$). Knowledge generally is the result of knowing and after people do sensing to the specified object. Sensing happens through the five senses of human beings, i.e. the sense of sight, hearing, smell, taste and feel. Most human knowledge is obtained through the eyes and ears. Providing nutritional lessons are conducted to increase knowledge to the child that can be the basis of the construction of the consuming habits [18]. Suhardjo (2003) [3] state a purpose to increase health, instilling habits and how good manner of eating does, develop knowledge and attitudes about the role of nutritious food for children's health and help in order to gain knowledge and skills regarding food and nutrition consumption.

Notoatmodjo (2010) [19] state an opinion or judgment against a stimulus or a particular object. In addition, nutritional attitudes of knowledge societies, also influenced by culture, eating habits at home and educational institutions place of children attended school. A regular eating habit within the family will form good habits for children. Conditioning breakfast at home or bring a lunch box from home is one example of a good conditioning. School environment can shape, eating habits for children. The results of this study showed an increase in pretest average score attitude about fruit and vegetable consumption by elementary school children of 77.53 ± 13.95 treatment group and 73.19 ± 15.46 in the control group. The post test average score of treatment group of 79.22 ± 21.41 and control group of 80.68 ± 11.81 . The results of statistical tests demonstrate the value $p > 0.05$, it means there is no significant difference between the attitude of treatment with a control group before being given a nutritional lesson by different learning methods. The pretest average score of fruit and vegetable consumption behavior of elementary school children amounted to 67.5 ± 13.1 of treatment group and 74.0 ± 14.9 for the control group. The post test average score of fruit and vegetable consumption behavior of elementary school children 70.5 ± 12.3 for treatment group and 75.9 ± 13.5 for the control group. The results of statistical tests demonstrated the value $p < 0.05$, means that there is differences behavior between treatment group ($p = 0.029$) and control group ($p = 0.046$) before being given a lesson in nutritional lessons by different learning methods.

Teachers play an important role as a role model in school in changing the attitudes and behaviors of elementary school children beside the role of parents. Knowledge about fruits and vegetables presented by teachers, parents and the nutritional education, media strongly supports the child behavior to consume fruits and vegetables. There is a meaningful relationship between knowledge of fruit and vegetable consumption in children [20]. The research of Kouli and Jago (2008) [21] showed that the availability of fruits and vegetables at home has a meaningful relationship with the level of fruit and vegetable consumption for children. Fibrihirzani (2012) [22] state the results of a statistical analysis of the existence of a meaningful relationship between individual characteristics (gender, knowledge and self confidence fondness), parents (habitual and parents support) and the environment (the availability of fruit and vegetable as well as the influence of peers) with fruit and vegetable consumption.

Parents as the role model strongly support the behavior of children's consumption. Dewi (2013) [7] state that there is a difference of perception between obese kids and parents against the collective factors. Children and parents' eating behavior showed the difference in favorite foods and the variety of consuming food. In line with research Mohamad (2015) [23], showed the results that there is a real difference of fruit consumption children based on maternal ethnic and employment ($p < 0.05$). Knowledge of child nutrition and father and mother's education is related to significantly positive with the consumption of fruit and vegetables, as well as a children's allowance, the availability of the fruit, and family income correlated significantly positives with children fruit consumption ($p < 0.05$) [23]. Lowe (2004) [24] state at three elementary schools in the United Kingdom proved that by a combination of interventions in the form of granting awards and peer modeling video for six episodes during the 16 days can increase fruit and vegetable consumption in children (intervention group with $p < 0.001$). In line with research Van Ansem (2014) [25] that child will consume more vegetables when their parents are consuming more vegetables, when their parents have a vegetable diet rules and when the vegetables are always available at home. Parents play an important role in the development of the child's diet. Children are more likely to have breakfast in their daily lives when their parents also breakfast.

5. Conclusions and Recommendations

Based on the results of the research that has been done can be concluded that:

Knowledge, attitude and behavior score of elementary school children against the consumption of vegetables and fruit increase after using nutritional lessons either animated or using lectures methods. There is a difference of nutritional knowledge before the nutritional lessons to elementary school children about fruit and vegetable consumption, using either animated or lectures medium ($p = 0.001$), there was no difference in knowledge after the nutritional lessons by using animated medium nor lectures medium ($p = 0,397$). There was no difference in attitude before the nutritional lessons to elementary school children, using either animated or lectures medium ($p = 0,160$) are also after nutritional lessons ($0,689$). There is a difference in fruit and vegetable consumption behavior before giving the nutritional lessons to children, using either animated or lectures medium ($p = 0,029$) and after the nutritional lessons as well ($0,046$). It is recommended that Increasing cooperation between “Dinas Pendidikan Kota Kediri” and the school in terms of improved facilities, learning medium and consumption program/eating fruit and vegetable together in the school. Some research about knowledge, role, and education of the mother, also fruit and vegetable consumption behavior of elderly people as a model or for an example to her son at home as well.

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