

NUTRITION EDUCATION IN TARAKANITA ELEMENTARY SCHOOLIN MAGELANG AND ITS EFFECTS ON THE CHANGES IN KNOWLEDGE, BEHAVIOR, AND ATTITUDE

**Nanik Suhartatik¹, Sri Handayani², Kirana Swasti Ningrum¹, Akhmad Mustofa¹,
Yustina Wuri Wulandari¹**

¹ *Departement of Agricultural Technology, Faculty of Technology and Food Industry, Slamet Riyadi University, Middle Java, Indonesia*

² *Departement of English Language Education, Faculty of Lecturer and Education Science, Slamet Riyadi University, Middle Java, Indonesia*
corresponding email: n_suhartatik@yahoo.com

Abstract

Wrong eating behavior in school-age children may end up in serious nutrition problems. During the periods of growth of elementary-school-age children, attention should be paid to their nutrition fulfilment. Inadequate knowledge of nutrition education may lead them to unhealthy food consumption. Healthy food itself is one which contains balanced nutritions. The introduction of fast food into the food health sector in Indonesia can also influence public diets. In order to evade future nutrition problems, nutrition education is thus necessary for elementary-school-age children, especially for the purpose of enhancing knowledge, attitude, and selection practice healthy foods and snacks. The menus for school-age children must have nutrition contents which are balanced and needed by the body. This research determines the effect of nutrition education on SD Tarakanita Magelang fifth graders' knowledge of healthy and nutritious food consumption. The 64 respondents enrolled in this research were divided into two classes: education and non-education classes. The respondents consisted of 10–13-year-old fifth graders. This research used a questionnaire for data collection. Pre-test was first conducted to both education and non-education classes. Then, to the education class four nutrition education materials were delivered. Two months afterward the final data were derived through post-test. The research results showed that the provision of nutrition education for the fifth graders of SD Tarakanita Magelang affected their food consumption knowledge, attitudes, and behaviors.

Keywords: elementary school, nutrition education, behavior, attitude

1. Introduction

Food and nutrition are two indispensable things in the stages of growth and development of the human body, especially in the case of children. Sufficient nutrition fulfilment in school-age children is critical in the physical growth. Malnutrition problems may cause children to be quickly fatigued, unable to sustain physical activities in long periods, and unable to think and participate fully in the learning process. Children with malnutrition are at a higher risk of suffering from various infections (Wijayanti, 2015). Nutrition knowledge in elementary school-age

children is influenced by a couple of factors, including information, experience, and immediate environment. Lack of knowledge of nutrition education in elementary school students may lead to unhealthy food consumption patterns.

Nutrition education is required by elementary school-age children particularly to improve their knowledge, attitude, and good snacking practice. The results of various research studies showed that nutrition education interventions can enhance knowledge, attitude, and practice in school-age children with varying levels of effectiveness (Nuryanto, Adriyan, Niken, & Muis, 2014).

According to Hardinsyah (1998), elementary school-age children need special attention as they are undergoing periods of growth. They, therefore, require nutritious food to support their physical growth and activities on a daily basis. Appropriate nutrition provision for school-age children must consider various aspects, including the economic, social, and cultural conditions and the religions of the children, in addition to their health status. Food for school-age children must comply with the principles of alignment (in accordance with the economic, social, and cultural conditions as well as the religions of the families), compatibility (in accordance with stages of growth and development of the children), and balance (the nutritional values must must the needs based on age and food types, e.g., carbohydrate, proteins, and fats).

Wrong eating habits in school-age children can cause serious nutrition problems such as obesity for those who are in excess of calories or malnutrition and stunting for those who lack nutrients. The data from the Riskesdas (Basic Health Research) show increases in obesity prevalence from year to year: from 10.5% in 2007 (Riskesdas, 2008), to 14.8% in 2013 (Riskesdas, 2014), and to 21.8% in 2018 (Riskesdas, 2019). This certainly needs special attention and concrete measures.

Fast food is food which is fast available and ready for consumption, such as fried chicken or pizza. The fast foods readily accessible on the market provide food variations to suit varying preferences and buying power. With easy and quick processing and storage, it is suitable for those who are very busy (Sulistijani, 2002). The number of calories contained per gram of fried chicken is 387.7 kcal; for a portion of burger it is 294.9 kcal, and for pizza, 291.1 kcal.

SD Tarakanita Magelang is a private elementary school in Magelang City. The school is strategically situated in an urban environment and in proximity of fast food

restaurants and various other snack vendors. This forms a habit in the students to consume various kinds of undernourished foods. The elementary school itself has a *Kantin Sehat* (hereafter Healthy Kantin) program which sells only safe foods for children and no drinks in plastic bags. Additionally, no plastic straws are used. However, many street vendors are still encountered around the school gate.

Magelang City has a total of 76 elementary schools spread in three districts, namely South Magelang District, North Magelang District, and Central Magelang District. Sixty-one of the elementary schools are publicly run, while the remaining 15 are privately run. SD Tarakanita Magelang itself not only is situated at the heart of the city but also attended by students of the middle-upper economic status. Such characteristics set the backdrop against which this research selected this elementary school as research object. Economic factors are also highly influential to children's habits in consuming junk food and fast food, the former being unhealthy or minimally nourished food and the latter being food with limited nutritional contents. Such diets are responsible for more nutrition problems and leading up to not only obesity but also an array of degenerative diseases such as cardiovascular diseases, diabetes mellitus, various cancers, to name a few (Soegih & Wiramihardja, 2009).

The elementary school period is a chief foundation to shape and educate children to better select nutritious, healthy foods which are suitable for consumption. Therefore, it is necessary to provide lessons or knowledge of nutritious, healthy foods to minimize obesity as early as possible. School-based health efforts can be made through socialization of healthy and balanced foods (Bambang, 2008).

2. Research Methods

This research was conducted at SD Tarakanita Magelang on Jl. Tentara Pelajar 25 Magelang, Central Java from February through July 2020. The object of this research was Tarakanita Elementary School Magelang students. Sample was extracted from a single grade (all fifth graders). The respondents were aged 10–13 years on average. The respondents consisted of 64 students which divided into two groups (32 students each). The first group received nutrition education (education class), while the second did not (non-education class). The research focused on the efforts to learn the effect of nutrition education on school-age children from early on. At the first stage, this research distributed a questionnaire

during pre-test to all respondents (n = 64). In the next stage, materials on nutrition education were provided for the education class. There were four materials given to the students each week for a duration of 40–90 per meeting.

The education techniques applied included lecture group discussion, question and answer session, group discussion, and brainstorming. Education was delivered four times with different materials. In the last stage, two months upon the provision of the education, final post-test data collection was conducted. These post-test data were derived from all the respondents (from both education and non-education classes). The data were analyzed with SPSS 20 program and ANOVA, normality test, and reliability test.

3. Result and Discussion

Analysis results were derived from all the 64 student respondents. It was found that 62.5% of the students were females and 37.5% males with an average age being in the 10–13 years of age range. Elementary school periods are split into lower grades (grades 1, 2, and 3) and higher grades (grades 4, 5, and 6). During these periods students pursue elementary education (Sudarmawan, 2013). Nearly all respondents brought lunch boxes to school (five times a week). This bore association with the respondents' pocket money. It was found that the students received pocket money of Rp31,000.00–51,000.00 per week. Ninety-five point three percent of their pocket money was used for snacking at the canteen. Over the course of school hours they were not allowed to exit the school environment. One point six percent of the respondents did spend their pocket money for snacks from street vendors outside the school environment, and 3.1% chose not to use their pocket money. The respondents' fathers mostly worked as traders and private employees, while their mothers mostly were housewives and traders. It was discovered that none of the respondents' fathers worked as farmers, indicating that the students of the elementary school were of the middle-upper economic status. On average the respondents' fathers run their own businesses. A slightly more than half of the respondents (53.1%) did not have a home assistant, while the rest did.

According to Table 1, there were significant differences identified from questions 1, 7, 9, and 10. The answer to the first question “is it true that junk food and fast food are different?” is “true”. The education class exhibited a difference before and after the nutrition education, in which case they tended to answer “false”

before the education but afterwards they understood better that junk food and fast food are different. As pointed out by Subiga & Florencia (2013), people often believe wrongly that fast food and junk food are the same.

Table 1. Kruskal Wallis test to identify the respondent knowledge to consumption behavior

Nr	Statement	Mean \pm SD			
		Class with nutrition education		Class without nutrition education	
		<i>Pre Test</i>	<i>Post Test</i>	<i>Pre Test</i>	<i>Post Test</i>
1	Junk food same as fast food	1,59 \pm 0,50 ^a	1,34 \pm 0,48 ^b	1,34 \pm 0,48 ^a	1,41 \pm 0,50 ^a
2	You can use French fries as a replacement of a breakfast	1,47 \pm 0,51 ^a	1,38 \pm 0,49 ^a	1,44 \pm 0,50 ^a	1,44 \pm 0,50 ^a
3	Junk food consider as unhealthy food	1,06 \pm 0,25 ^a	1,03 \pm 1,77 ^a	1,09 \pm 0,30 ^a	1,00 \pm 0,0 ^a
4	Biscuit produce by food industry were using preservative	1,19 \pm 0,40 ^a	1,22 \pm 0,42 ^a	1,41 \pm 0,50 ^a	1,13 \pm 0,34 ^b
5	We could not focus on the class because we were not having enough breakfast	1,09 \pm 0,30 ^a	1,03 \pm 0,18 ^a	1,00 \pm 0,0 ^a	1,03 \pm 0,18 ^a
6	Consuming sweetened packed drinks more than once a day was an unhealthy life style	1,03 \pm 0,18 ^a	1,06 \pm 0,25 ^a	1,19 \pm 0,40 ^a	1,06 \pm 0,25 ^a
7	Rice + fried chicken + spicy tomato sauce + sweetened ice tea were followed "isi piringku" standard	1,47 \pm 0,51 ^a	1,72 \pm 0,46 ^b	1,47 \pm 0,51 ^a	1,63 \pm 0,49 ^a
8	Drinking fermented milk could facilitate the bowl movement	1,28 \pm 0,46 ^a	1,09 \pm 0,30 ^a	1,13 \pm 0,34 ^a	1,09 \pm 0,30 ^a
9	We have to eat at least 5 different color of fruit and vegetable a day	1,75 \pm 0,44 ^a	1,25 \pm 0,44 ^b	1,72 \pm 0,46 ^a	1,53 \pm 0,51 ^a
10	Tofu and tempe were not enough to fulfill the need to protein	1,38 \pm 0,49 ^a	1,63 \pm 0,49 ^b	1,63 \pm 0,49 ^a	1,50 \pm 0,51 ^a

Note:

- Value with different code in the same column showed a significant difference using Kruskal Wallis at 5% of significance level
- Smaller value showed that the respondent were tend to have right answer

The answer to the question "is it true that rice + crispy fried chicken + chili sauce + iced tea is sufficient for one "isi piringku" diet?" is false. The respondents from the education class experienced a significant increase in knowledge after education. This is in line with the "isi piringku" concept which states that one diet should consist

of the main meal, side dish, fruit, and vegetable. The answer to the ninth question “Is it true that we must consume vegetables and fruits of a minimum of five colors?” is true. The education class demonstrated a significant difference. In the post-test the respondents were inclined to answer “true”. The answer to the last question “is it true that tofu and tempeh are inadequate for the fulfilment of the protein need of the body?” is false. The education class respondents experienced a significant increase in knowledge after education. Tofu and tempeh are among vegetable sources of proteins.

The research results in the non-education class too exhibited significant differences between the pre-test and post-test, both increases and decreases in knowledge. A significant difference was found in the fourth question “is it true that manufactured biscuits contain preservatives?”. The answer to this question is “true”. At first the respondents tended to answer wrongly but after the post-test the answers were correct. This could be because outside the school the non-education respondents acquired information or knowledge on that matter.

According to the answers to the true/false questions given by the respondents, the education class proved that the nutrition education provided influenced their attitude and mind set. The respondents from the education class showed an insignificant difference ($p > 0.05$) in the follow-up Kruskal Wallis test. With the statement “I would read the composition list of the food I am to eat”, the respondents agreed during the pre-test on average and nearly strongly agreed during the post-test. Insignificant differences also occur between the pre-test and the post-test in the education class in the statements “It is okay to have sweet drinks three times a day”, “I would buy foods/drinks of bright colors”, and “I would rather eat home-made foods than buy foods outside”. However, in the fifth statement, the respondents showed a significant difference. At first the respondents agreed with the statement, but after the post-test they tended to agree even more strongly. The results of the follow-up Kruskal Wallis test analysis for the non-education class also showed an insignificant difference as can be seen in Table 2.

Table 2. Kruskal Wallis test for behavior change in class with and without nutrition education

Nr	Behavior	Change in value (Mean ± SD)			
		Class with nutrition education		Class without nutrition education	
		<i>Pre Test</i>	<i>Post Test</i>	<i>Pre Test</i>	<i>Post Test</i>

1	I will read the nutrition facts before I eat	2,38 ± 1,34 ^a	1,88 ± 0,94 ^a	2,03 ± 1,23 ^a	1,69 ± 0,90 ^a
2	Sweetened drinks could be consumed more than three times a day	4,28 ± 0,77 ^a	3,84 ± 1,08 ^a	3,90 ± 1,06 ^a	3,75 ± 1,02 ^a
3	I will buy food that a bright color	4,53 ± 0,67 ^a	4,38 ± 0,66 ^a	4,16 ± 0,88 ^a	4,16 ± 0,85 ^a
4	I would like to dine at home than dining outside (restaurant, café, food trucks, etc.)	1,59 ± 1,01 ^a	1,56 ± 0,80 ^a	1,53 ± 1,02 ^a	1,84 ± 1,14 ^a
5	I would like to choose boiled peanut rather some packed food or industrial processed food	2,44 ± 1,51 ^a	1,53 ± 0,51 ^b	2,28 ± 1,46 ^a	2,31 ± 1,45 ^a

Note:

- Value with different code in the same column showed a significant difference using Kruskal Wallis at 5% of significance level
- Smaller value showed the agreement of the respondent to the statement

In this questionnaire the respondents were asked to provide information on their frequencies of consumption of a list of foods and drinks included in the questionnaire. There were 16 foods and 4 drinks included, making up 20 in total. Five options of answers were provided: every day; once a week; three times a week; once a month; and once a year.

It was also found that the education and non-education respondents consumed rice every day. Cooked rice is a main meal from uncooked rice kernels the Indonesians usually consume. It contains carbohydrate, protein, fat, and water. Of the four, the dominant content is carbohydrate. Therefore, rice is consumed by most Indonesian people as a main source of carbohydrate in daily menu (Sholihin, Haq & Anna, 2010).

The respondents also routinely consumed milk, fruits, and vegetables, and they did so nearly every day. The respondents from both the education and non-education classes consumed vegetables more often after the post-test. In a previous study (Agnes, 2020) it is stated that fruits and vegetables were the most consumed by the respondents every day. Instant noodle decreased in frequency of consumption, especially in the case of the education class. This shows that nutrition education did change the frequency of food consumption.

Table 3. Kruskal Wallis test for the food frequency

Nr	Food	Mean ± SD of FFQ for			
		Nutrition education		Without nutrition education	
		<i>Pre Test</i>	<i>Post Test</i>	<i>Pre Test</i>	<i>Post Test</i>
1	Rice	1,13 ± 0,71 ^a	1,00 ± 0,00 ^a	1,00 ± 0,00 ^a	1,00 ± 0,00 ^a

2	Potato	2,75 ± 1,16 ^a	2,66 ± 1,07 ^a	2,50 ± 0,98 ^a	2,97 ± 1,00 ^a
3	Corn	3,28 ± 1,17 ^a	3,09 ± 1,25 ^a	3,03 ± 1,33 ^a	2,91 ± 1,03 ^a
4	Cassava	3,53 ± 1,14 ^a	3,78 ± 1,18 ^a	3,38 ± 1,34 ^a	3,50 ± 1,27 ^a
5	Noodle	2,56 ± 0,95 ^a	2,72 ± 0,96 ^a	2,88 ± 1,26 ^a	3,31 ± 1,12 ^a
6	Chicken	2,41 ± 1,07 ^a	2,38 ± 0,98 ^a	2,03 ± 0,97 ^a	2,16 ± 0,89 ^a
7	Beef/lamb	3,25 ± 1,37 ^a	3,00 ± 1,30 ^a	3,38 ± 1,48 ^a	2,88 ± 1,29 ^a
8	Fish	2,63 ± 1,01 ^a	2,72 ± 0,99 ^a	2,97 ± 1,20 ^a	2,88 ± 1,13 ^a
9	Tofu	2,47 ± 1,22 ^a	2,53 ± 1,32 ^a	2,47 ± 1,37 ^a	2,16 ± 1,05 ^a
10	Tempe	2,19 ± 1,09 ^a	2,19 ± 0,97 ^a	2,13 ± 1,13 ^a	2,22 ± 1,18 ^a
11	Milk	1,44 ± 0,91 ^a	1,50 ± 1,02 ^a	1,31 ± 0,90 ^a	1,50 ± 0,88 ^a
12	Yoghurt/fermented milk	2,59 ± 1,13 ^a	2,66 ± 1,33 ^a	2,56 ± 1,22 ^a	2,56 ± 1,22 ^a
13	Fries (“gorengan”)	2,44 ± 1,05 ^a	2,25 ± 0,84 ^a	2,53 ± 1,05 ^a	2,19 ± 1,03 ^a
14	Fatty food	3,34 ± 1,12 ^a	3,28 ± 1,14 ^a	3,59 ± 1,19 ^a	2,97 ± 1,15 ^b
15	Burger	3,28 ± 1,17 ^a	3,44 ± 1,19 ^a	3,56 ± 1,32 ^a	3,84 ± 1,11 ^a
16	Pizza	3,63 ± 1,16 ^a	3,81 ± 0,97 ^a	3,59 ± 1,27 ^a	3,88 ± 1,01 ^a
17	Carbonated drinks	3,84 ± 1,02 ^a	3,94 ± 1,13 ^a	3,69 ± 1,35 ^a	3,97 ± 1,38 ^a
18	Sweetened drinks	2,41 ± 1,10 ^a	3,19 ± 1,28 ^b	2,56 ± 1,37 ^a	3,06 ± 1,22 ^a
19	Fruits	1,78 ± 0,79 ^a	1,94 ± 1,13 ^a	1,59 ± 0,87 ^a	1,75 ± 0,95 ^a
20	Vegetable	1,88 ± 1,13 ^a	1,31 ± 0,78 ^b	1,88 ± 1,26 ^a	1,63 ± 0,94 ^a

Note:

- The smaller value refer to the frequency of the volunteer to consume the food, 1 for once a day, 2 for three times a week, 3 for once a week, 4 for once a month, and 5 for once in a year.
- Value with different code in the same column showed a significant difference using Kruskal Wallis at 5% of significance level

As recommended by the Balanced Nutrition Guidelines, people aged > 20 years should consume vegetables in 3–5 portions, which is equal to 250 grams per day, and fruits in 23 portions, which is equal to 150 grams per day (Risksedas, 2013). The dominant nutritional contents in vegetables and fruits are vitamins and minerals (Hermina & Prihatini, 2016). The results of the inquiry into the consumption of some foods and drinks generally showed no difference in the respondents’ eating habits. If there were any differences, they were statistically insignificant.

4. FINDINGS

This research was conducted at Tarakanita Elementary School Magelang on averagely 10–13-year-old fifth graders. The demographic conditions of the respondents like the occupations of their parents, the presence of home assistants, lunch boxes, and pocket money strongly influenced the behaviors, attitudes, and knowledge of the respondents prior to choosing what foods and snacks to be consumed. Tarakanita Elementary School Magelang is strategically situated in an urban environment and in proximity of fast food restaurants and various other snack vendors. This forms a habit in the students to consume various kinds of undernourished foods. Magelang itself not only is situated at the heart of the city but also attended by students of the middle-upper economic status. Economic factors are also highly influential to children’s habits in consuming junk food and

fast food. Februhartanthy's research (2005) proved that the nutrition education provided by school-age children is effective in changing their knowledge of and attitude toward food. It is easier for school-age children to change their behaviors than for adults. It is expected that the nutrition education given will increase elementary school-age children's knowledge of balanced nutrition guidelines. Knowledge will influence everyday balanced nutrition attitude and practice. This balanced nutrition practice is expected to reduce nutrition problems among children. Some existing studies found some foods and drinks which saw reduced consumption after the provision of nutrition education. The foods and drinks which decreased in consumption frequencies after nutrition education were carbonated drinks, sweetened drinks, and bottled drinks. The respondents consumed foods and drinks while still giving attention to the composition. They ate burger and pizza. The characteristics of the occupations of the respondents' parents could be seen in their economic status. Based on this parent occupation factor, variations in nutritional status of the respondents were identified. As stated by Aziz (2004), socioeconomic status also influences children's growth and development. Children of high socioeconomic status are better fulfilled in their nutrition needs than those of lower socioeconomic status. This is one of the drivers of the respondents to frequently consume fast food or unhealthy foods. The respondents tend to follow the existing, instant food trends.

5. Conclusions and suggestions

This research at Tarakanita Elementary School-Magelang concludes that the provision of nutrition education influenced the respondents' knowledge, behaviors, and attitudes toward health food selection. Nutrition education could change the respondents' opinions on the consumption of some junk foods. In the non-education class, opinions on junk foods did not significantly influence the respondents.

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