



The Effectiveness of Nutrition Comic, Cards and Video on Nutritional Knowledge of Elementary School Students in Sebatik Island, North Kalimantan

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Abstract. Background: The double burden of malnutrition still occurs in Indonesia, especially in school-age children. The prevalence of underweight and obese children aged 5–12 years in Nunukan Regency, North Kalimantan was 4.2% and 20.2%, respectively. One of the causes of nutritional problems in school-age children is an inappropriate food consumption pattern. This can be influenced by the lack of nutritional knowledge. This study aims to determine the effectiveness of nutrition cards, comics and videos on nutrition knowledge of elementary school students. **Methods:** This was a Quasi Experimental Design with a Nonequivalent Control Group research design. The subjects were 83 elementary school students aged 10–13 years on Sebatik Island, North Kalimantan. Students were selected using purposive sampling method. Data of nutritional knowledge were obtained using the pretest-posttest form, that taken before and after the intervention using cards, comics and nutrition videos. Data were analyzed using paired T-test and oneway ANOVA with $p < 0.05$. **Results:** The results showed that there were significant differences in the mean pretest and posttest scores before and after education in each treatment group ($p < 0.05$). There was a significant difference in the changes in the pretest and posttest scores between the treatment groups ($p < 0.05$). In addition, based on Bonferroni's post hoc test, comics were more effective than controls group and statistically significant ($p < 0.05$). **Conclusion:** Comic was more effective to increase nutrition knowledge than the control group. Educational media should be made as attractive as possible so that the message can be delivered optimally to students.

Keywords: school-age children · card · comic · video · knowledge

1 Introduction

The double burden is a nutritional problem that still occurs in Indonesia, one of which is in school-age children. Many school children are malnourished, but at the same time there are children who are overweight. The prevalence of underweight and obese nutritional status in children aged 5–12 years in Indonesia is 9.2% and 20% [1]. Based on the results of the Basic Health Research, Nunukan Regency has a lean prevalence of 4.2% and fat 20.2% for the same age group [2]. However, there has been no research related to the factors that contribute to the prevalence of thin and fat in Nunukan Regency.

Nutritional problems in elementary school age children can be caused by low consumption of fruit and vegetables, low protein consumption because protein sources come from vegetable protein, low fluid consumption, consumption of foods and beverages high in sugar, salt and fat [1]. This shows that food consumption is not in accordance with the Guidelines for Balanced Nutrition (PGS). This problem can be influenced by a lack of knowledge about balanced nutrition. Increased knowledge of nutrition in school-age children becomes very important in order to optimize physical growth, psychological, and perfect cognitive development [3]. Elementary school children who have less knowledge, most of them have negative attitudes towards balanced nutrition and behavior that has not implemented balanced nutrition [4].

Education is one of the factors that influence a person's knowledge and attitudes [5]. Health and nutrition problems that arise apart from being caused by germs (biological factors) are also caused by a person's behavior. Efforts can be made through nutrition education that is oriented towards behavior change. Nutrition education given to elementary school age children must be considered properly, such as the selection of learning media. Learning media is attempted to be interesting so that the delivery of material can be accepted more easily. Not only displaying writing, but learning media can also be provided with games, videos and writing accompanied by color images, such as comics.

The results of a study conducted on fourth grade students showed a significant increase in knowledge after being given an intervention using comics [6]. The provision of nutrition education using videos also showed a significant increase in knowledge of fifth grade students in Bengkulu [7]. Another study stated that counseling using vegetable cards was more effective than the lecture method on increasing the knowledge of elementary school students [8].

Therefore, nutrition education with various media can increase nutrition knowledge in school-age children. However, research on the effectiveness of using cards, comics and nutrition videos for primary school children is still limited in Indonesia. In addition, research on nutrition counseling outside Java has not been widely carried out, especially on Sebatik Island, Nunukan, North Kalimantan.

2 Methods

This research is a Quasi Experimental Design with a Nonequivalent Control Group research design. The subjects of this study were children aged 10–13 years who were in Sebatik Islands elementary school totaling 83 students. Sampling was done by purposive sampling. Inclusion criteria: students aged 10–13 years who were registered as active in elementary school and signed an informed consent by their parents/guardians. Exclusion criteria: absent when nutrition counseling was conducted, did not participate in all series of research activities and resigned to be the research sample. The research protocol was approved by the Health Research Ethics Committee of Universitas Aisyiyah Yogyakarta number 177/KEP-UNISA/IV/2021.

Nutrition knowledge questionnaire using nutrition questionnaire for elementary school students from the study. The nutrition card is made by the researcher. The nutrition card contains material sources of food containing nutrients and balanced nutrition guidelines. Nutrition comics use comics which contain material from food sources containing nutrients and balanced nutrition guidelines. The video comes from the Ministry of Health which contains food source material that contains nutrients and balanced nutrition guidelines.

Univariate analysis was used to see the frequency distribution of respondents' characteristics and knowledge of nutrition. Bivariate analysis was used to explain the effect of nutrition cards, comics and videos on nutrition knowledge in elementary school children. The test used is the paired t-test. Meanwhile, to explain the effectiveness of the use of media on the nutritional knowledge of elementary school students, using the one-way ANOVA test and continued with the Bonferonni test to see the differences between groups.

3 Results and Discussion

Based on Table 1, the mean age of the students was 11.08 ± 0.81457 years old. More than half of the students are female (57.8%) and the ethnic are Bugis (54.2%). The results showed that there were significant differences in the mean pretest and posttest scores before and after being given education in each treatment group ($p < 0.05$). The posttest results in all treatments were higher than the pretest results (Table 2). Table 3 shows that there are significant differences in changes in pretest and posttest scores between treatment groups ($p < 0.05$). In addition, based on Bonferonni's post hoc test, comics were more effective than controls, as indicated by higher comic deltas and statistically significant results ($p < 0.05$).

One way ANOVA test. Bonferonni post hoc test: comics vs cards $p = 0.077$; comics vs videos $p = 1,000$; comic vs control $p = 0.028$; card vs video $p = 0.985$; card vs control $p = 1,000$; video vs control $p = 0.445$.

Table 1. Subject Characteristics

Characteristic	Total	Mean \pm SD
	n (%)	
Age (years old)		11,08 \pm 0,81457
10	21 (25,3)	
11	37 (44,6)	
12	22 (25,6)	
13	3 (3,6)	
Sex		NA
Boy	35 (42,2)	
Girl	48 (57,8)	
Ethnic		NA
Bugis	45 (54,2)	
East	38 (45,8)	
Group intervention		NA
Comic	21 (25,3)	
Card	21 (25,3)	
Video	22 (26,5)	
Control	19 (22,9)	

Table 2. Mean of Pretest and Posttest Difference

Group intervention	Mean	p
Comic		0,0000*
Pretest	9,76	
Posttest	16,08	
Card		0,0000*
Pretest	10,71	
Posttest	14,85	
Video		0,0000*
Pretest	10,86	
Posttest	16,59	
Control		0,0002*
Pretest	10,52	
Posttest	14,15	

Table 3. Differences in Nutrition Knowledge Between Intervention Groups

Group intervention	Mean ± SD	p
Comic	7,047 ± 4,005	0,0169*
Card	4,415 ± 4,246	
Video	5,727 ± 2,763	
Control	3,631 ± 3,639	

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