EFFECT OF BALANCED DIET EDUCATION WITH MEDIA COMIC ON MODIFICATION OF EATING BEHAVIOR IN ADOLESCENTS AT MIDDLE SCHOOL, MALANG

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ABSTRACT

Background: Obesity remains the main malnutritional problem globally. One of the contributing factors is the imbalance diet eating behavior. This study aimed to analyze the effect of balanced diet education with media comic on modification of eating behavior in adolescents at middle school, Malang, East Java.
Subjects and Method: This was a quasi-experimental with a pretest and post-test control group design conducted at Middle School, Malang, East Java, in November 2018. A sample of 64 students was randomized into two groups: (1) Experiment group that received diet education using media comic, and (2) Control group that received no intervention. The dependent variables were knowledge, attitude, and skill of eating behavior. The independent variable was diet education using media comic. The data were analyzed by Man-Whitney test
Results: After the intervention, the experimental group had higher mean of knowledge (Mean= 92.72; SD= 10.78), attitude (Mean= 83.23; SD= 18.13), and skill (Mean= 78.79; SD= 16.94) than the control group, including knowledge (Mean= 88.68; SD= 11.47), attitude (Mean= 87.60; SD= 8.60), and skill (Mean= 79.94; SD= 14.31), and it was statistically insignificant in each outcomes, (p= 0.151), (p= 0.223), and (p= 0.770) respectively.
Conclusion: Diet education with media comic is effective in improving knowledge, attitude, and skill of eating behavior in students, but it is not statistically significant.

Keywords: diet education, media comic, eating behavior, balanced diet

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BACKGROUND

Obesity is currently an over-nutrition problem that was found at various ages, including toddlers, children, adolescents, adults, and the elderly. In 2008, it was found that 35% of the adult population in the world was obese, and 6.7% of the world's child population was overweight and obese in 2010. Obesity at the age of 0-18 years needs to be watched out because it will be at risk of suffering from obesity to adulthood (WHO, 2016).

Basic Health Research in 2007 showed that the prevalence of obesity in people aged ≥15 years was 19.10% consisting of 8.80% overweight and 10.30% obesity. There was an increase in 2010 to 21.70% consisting of overweight 10.00% and obesity by 11.70% (Aryani, 2010). In 2013, the prevalence of obesity among adolescents aged 16-18 years was 7.30% consisting of fat 5.70% and obesity 1.60%.

Fifteen provinces with a prevalence of very fat above the national prevalence, including Bangka Belitung, Central Java, South Sulawesi, Banten, Central Kalimantan, Papua, East Java, Riau Islands, Gorontalo, DI Yogyakarta, Bali, East Kalimantan, North Sulawesi, and DKI Jakarta (Muwakidah, 2008).

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Nur A (2012) study showed that learning media using pictorial comics can improve students' learning outcomes as seen from the gain scores, including moderate criteria, increase student activity, increase student interest, and get positive responses from students. This study aimed to analyze the effect of balanced diet education with media comics on modifying eating behavior in adolescents at middle school, Malang, East Java. This study's specific objectives were to analyze the obese adolescents' level of knowledge, attitudes, and skills in junior high schools in Malang City, examining the food intake of obese adolescents in one of the city's junior high schools.

SUBJECTS AND METHOD

1. Study Design

This was a quasi-experimental with a pretest and post-test control group design conducted at Middle School, Malang, East Java, in November 2018.

2. Population and Sample

A sample of 64 obese students was selected purposively into two groups: (1) Experiment group that received diet education using media comic, and (2) Control group that received no intervention.

3. Study Variables

The dependent variables were knowledge, attitude, and skill of eating behavior. The independent variable was diet education using media comics.

4. Study Instruments

The instruments used in this study were questionnaires, a weighing scale, and balanced nutrition comics.

5. Data Analysis

Univariate analysis was conducted to show the sample characteristics in frequency distribution. Bivariate analysis was conducted using Man-Whitney test.

RESULTS

1. Characteristics Sample

Measurement of the nutritional status of respondents in the obesity category was carried out based on the BMI index. Characteristics of the sample were described in Table 1.

Table 1. Characteristics Sample (categorical data)

No. of Junior High School, Malang	Number of Obese Students
No.3 Junior High School	10
No. 5 Junior High School	30
No. 8 Junior High School	24
Total	**64**

Table 1 showed the number of obese students in 3 Junior high schools in Malang City. The majority of obese students were in No. 5 Junior High School, as many as 30 students and the least were in No. 3 Junior High School as many as 10 students.

Table 2 showed the Man-Whitney test on differences in median knowledge, attitude, and skills between the intervention and control groups, both before intervention, after intervention, and the difference after-before intervention.

Table 2 showed that median of the knowledge after intervention between the intervention and control group different, it was not statistically significant (p= 0.066). The effectiveness of the intervention was determined by comparing the difference in knowledge scores post-pre intervention. The difference in knowledge post-pre intervention in the intervention group (Median= 0; SD= 15.28) was smaller than the control group (Median= 0.02; SD = 16.25), and it was statistically significant (p = 0.066).

Median of the attitude after intervention between the intervention group and the control group was not different, and it was statistically insignificant (p= 0.777). Similar to the above, the effectiveness of the intervention was determined by comparing the difference in median attitude post - pre intervention. The difference in median atti-

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tude post - pre intervention in the intervention group (Median= 0; SD= 14.44) was smaller than that of the control group (Median= 7.09; SD= 19.22), and it was statistically not significant (p= 0.777).

Median of skill after intervention between the intervention and control groups were not different, and it was not statistically insignificant (p= 0.668). Similar to the above, the effectiveness of the intervention was determined by comparing the difference in median of skill after intervention and control. The difference in median skill post - pre intervention in the intervention group (Median= 12.50; SD= 25.81) was smaller than the control group (Median= 12.30; SD= 22.12), and it was statistically not significant (p = 0.668).

Table 2. The results of the Man-Whitney test on differences in median knowledge, attitude, and skills between the intervention and control groups, both before intervention, after intervention, and the difference after-before intervention

Information	Treatment	Control		Intervention		p
		Median	SD	Median	SD	
Knowledge	Preintervention	88.90	10.29	100	15.90	0.012
	Postintervention	88.90	10.70	88.9	12.00	0.890
	Post-pre intervention	0.02	16.25	0	15.28	0.066
Attitude	Preintervention	78.60	9.52	85.70	10.54	0.085
	Postintervention	85.70	16.88	92.80	9.95	0.236
	Post-pre intervention	7.09	19.22	0	14.44	0.777
Skill	Preintervention	75	16.99	75	17.83	0.731
	Postintervention	87.50	16.81	75	14.22	0.700
	Post-pre-intervention	12.30	22.12	12.50	25.81	0.668

DISCUSSION

The level of knowledge and attitudes of obese students was influenced by the education obtained during the learning period and the influence of the environment around young women. According to the stimulus-response theory of students' learning process, they take and combine responses by repeating them. The responses were obtained by giving a stimulus in education to the experimental group by giving comics for 3 weeks and without education for 3 weeks. With this learning process, students have not understood the material given or in the comics.

Baron (2004) stated that an attitude of growth begins with the knowledge that is perceived as a good or bad thing, then into internalization. This can mean that a good attitude and less formed from the component of knowledge. It affects one's behavior in this case is the selection of a balanced diet.

The level of nutritional knowledge of a person affects attitudes and behavior in food selection. Increased knowledge, attitudes, and skills to interact with each other from distinctive patterns of behavior. Skills or actions will last if they were based on good knowledge and attitudes (Notoatmodjo, 2007). According to Bastable (2002), information acceptance through sensation can only be absorbed by 20%. The use of educational tools in the form of a food model helps students understand the educational material. So that it affects the skills of students in selecting food ingredients.

Based on the recall results, there were frequent consumption fried chicken and other fired foods. Subjects in this study rarely ate vegetables. From the results of mentoring

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using comics for 3 meetings, some students experienced changes in their diet, such as replacing rice with bread, reducing the portion of rice in one meal, and eating vegetables. Apart from the intake factor, students only relied on sports lessons that were only once a week at school exercise.

In addition, the incidence of obesity in children is associated with the obese parents. According to Whitney and Hegarthy in Manurung (2009), genetics plays an important role in influencing a person's weight and body composition. If both parents are obese, the chance of their children obese was 75-80%. If one parent is obese, the probability is only by 40%. If neither of the parents is obese, the chance of obese children is relatively small (<10%).

The factors that influence eating behavior, according to Worthington-Roberts (2000) were the ease of obtaining fast food. Fast food is easy to find anywhere, especially in big cities. Examples of fast foods are fried chicken, burgers, and pizza. In general, these foods are rich in energy, fat, carbohydrates, and salt, but lacking vitamin A, vitamin C, folic acid, calcium, and fiber.

When there is a peak in growth, adolescents should often eat the amount according to their needs. Adolescent nutritional needs can use the NAR (Nutritional Adequacy Rate) based on age and sex. Unhealthy eating habits in large quantities during adolescence can eventually lead to obesity and degenerative diseases. Through health education in schools, adolescents are expected to know what to consume and what to avoid, and when to eat (Worthington-Robert, 2000).

Provision of balanced nutrition comic media with assistance can affect changes in dietary intake of carbohydrate and fiber sources, from those who initially rarely consume fiber-source foods, to increasing intake of fiber sources. The limitations of this study was mentoring was not optimal due to the limited time of the research. The interview sections needed to conduct in more detail regarding the intake and diet of students, so that the factors that cause obesity in adolescents can be overcome.

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