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Original Research

The Effect of Nutrition Education Using Videos and E-booklets on Increasing Knowledge of Balanced Nutrition in High School Students in Jakarta

Pengaruh Pemberian Edukasi Gizi Video dan E-booklet Terhadap Peningkatan Pengetahuan Gizi Seimbang pada Remaja di Jakarta

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Abstract: *The adolescent counts as a productive age group who needs an adequate nutritional intake to ensure their productivity in their studies and work. A long-term period of unbalanced nutrition consumption might impact one's health and productivity. One of the interventions that can be done is through education to increase their knowledge of balanced nutrition. The media used in this research are e-booklets and videos.* ***Objectives:*** *This research aims to understand the difference between balanced nutrition knowledge before and after nutritional education using E-booklets and videos among high school students in Jakarta and also to find the difference in the effectiveness of both media.* ***Methods:*** *The sampling technique used in this research was random sampling with a total of 95 respondents. The method used is a quasi-experiment with a Wilcoxon test to find the difference in knowledge before and after the intervention and a Mann-Whitney test to find the difference between media effectiveness in increasing knowledge.* ***Results:*** *The results show that both e-booklets (p-value = 0.000) and videos (p-value = 0.000) give a significant effect in increasing balanced nutrition knowledge levels. There is also no significant difference in the effectiveness of both media (p-value = 0.350).* ***Conclusion:*** *Balanced nutrition education using e-booklets and video proven to be effective in increasing nutrition knowledge in adolescents. Further research could be done by expanding the population and increase sample number.*

Keywords: adolescent, balanced nutrition, e-booklets, nutrition education, videos

1. INTRODUCTION

In 2018, it was found that 20.7% of adolescents aged 16-18 years in Jakarta were classified as short, and 29.9% of young women aged 12-18 years in DKI Jakarta were at risk of chronic energy deficiency. Jakarta also ranks the second highest for central obesity of the ≥15 years old group (1). Meanwhile, Indonesia is currently in a period of demographic bonus and one of the things that affect the quality of the population of productive age is nutritional status (2). A person's nutritional status is influenced by many factors, one of which is knowledge of balanced nutrition. Nutritional knowledge has a direct impact on attitudes and dietary practices. The causes of low nutritional knowledge include a lack of knowledge and socialization regarding nutritious, balanced, and safe food (3). Therefore, one of the efforts that can be made to reduce the number of nutritional problems in adolescents is to carry out educational efforts by providing nutrition education.

Things that need to be considered to achieve maximum effectiveness in efforts to provide education include the need to consider the tendency of the target's interest. Seeing the closeness of Generation Z teenagers to technology (4), digital-based educational media is the main choice for being a means of education for teenagers. According to research (5), it is known that balanced nutrition education for adolescents using video media can increase respondents' nutritional knowledge, which originally had an average of 8.11, increased to 12.08. Other media is visual media in the form of booklets in digital form (e-booklets). This media can be stored for a long time so that it can be reused by users and displays detailed information such as statistics that are difficult to convey by non-visual media (6).

This research was conducted at SMK Negeri 57 Jakarta which is a State Vocational High School in the Tourism Sciences family with 5 majors. Vocational high school students are generally targeted to immediately enter the world of work after graduation, thus increasing the urgency for balanced nutrition education to obtain optimal quality work. The purpose of this study was to determine whether there were differences in the level of knowledge of balanced nutrition in the e-booklet and video intervention groups before and after treatment. In addition, this study also aims to determine whether there are differences in the effectiveness of the two media in increasing knowledge of balanced nutrition in adolescents.

2. METHODS

This research was conducted in 3 months from April to June 2022 with participants from SMKN 57 Jakarta. Samples were then taken with specific criteria including currently studying in the sophomore year, have not learned about nutrition as a school subject in school (excluding students from the culinary department), and needing to complete all of the research agendas & forms. Samples were taken with random sampling from all classes in the hospitality and musical arts major with the consideration that the two majors did not receive subjects in Basic Nutrition and Applied Science in Food Science and had the least gap between male and female students compared to other majors so that it was expected to minimize gender-biased result. The selected respondents were then divided into 2 intervention groups, the video intervention group, and the e-booklet intervention group. The media used in this study has passed the feasibility, validity, and reliability test on non-respondent students.

Preliminary data collection using identity questionnaires (respondent characteristics) and pre-test questionnaires on nutritional knowledge is carried out using quiziz media. Each group was given an educational video and booklet over a distance of 3 days after giving the pre-test for 3 consecutive days. The post-test questionnaires were given within 3 days after the last day of intervention. Retrieval of data is controlled by limiting the filling time of each question to 45 seconds. The data that has been collected then goes through the stages of data processing and analysis as material for compiling research results.

3. RESULTS

The population was taken from the total students of SMKN 57 Jakarta which at the time of data collection totaled 1,258 students. The samples were calculated using the finite formula (7) resulting in the minimum sample taken being 98 people. In conducting the research, there were 3 respondents excluded because they did not

complete the research, leaving 47 respondents in the e-booklet intervention group and 48 respondents in the video intervention group.

Table 1. Characteristic of Participants

Participant's Characteristic	N = 95	%
Age		
15 years old	3	3,2
16 years old	21	22,1
17 years old	53	55,8
18 years old	13	13,7
19 years old	5	5,3
Gender		
Male	27	28,4
Female	68	71,6
Nutrition Education History		
Have not received any	61	64,2
Have received any	34	35,8
Father's Latest Education		
Primary School	6	6,3
Secondary School	19	20,0
High School	50	52,6
College / University Degree	29	21,2
Mother's Latest Education		
Primary School	8	8,4
Secondary School	25	26,3
High School	50	52,6
College / University Degree	12	12,6
Father's Occupation		
Unemployed	4	4,2
Teacher / Lecturer	5	5,3
Merchant / Businessman	14	14,7
Employee	38	40,0
Others	34	35,8
Mother's Occupation		
Unemployed	60	63,2
Teacher / Lecturer	4	4,2
Merchant / Businessman	13	13,7
Employee	7	7,4
Others	11	11,6
Father's Income		
< Rp 4.453.935	55	57,9
≥ Rp 4.453.935	40	42,1
Mother's Income		
< Rp 4.453.935	78	82,1
≥ Rp 4.453.935	17	17,9

According to the result, the respondent characteristic is dominated by the age group of 17 years old (55,8%), the gender female (71,6%), those who have not received nutritional education before (64,2%), whose father is in high school graduate (52,6%) and work as an employee (38%) with income lover than Rp 4.453.935 (57,9%), and whose mother is high school graduate (52,6%) and unemployed (63,2%) with income lower than Rp 4.453.935 (82,1%).

Table 2. Pre-Test and Post-Test Score Level of Video Intervention Group

Category	Pre-Test		Post-Test	
Knowledge Level	**N = 48**	**%**	**N = 48**	**%**
Less	23	47,9	1	2,1
Enough	20	41,7	13	27,1
Good	5	10,4	34	70,8
Mean	60,94		81,98	
SD	13,748		10,249	
Min-Max	40-95		55-100	

In video intervention group, the pre-test assessment shows most of the participants' nutritional knowledge counts as 'Less' as many as 23 people (47,9%), while the post-test shows the majority counts as 'Good' as many as 34 people (70,8%).

Table 3. Pre-Test and Post-Test Score Level of E-booklet Intervention Group.

Category	Pre-Test		Post-Test	
Knowledge Level	**N = 47**	**%**	**N = 47**	**%**
Less	16	34,0	0	0
Enough	25	53,2	18	38,3
Good	6	12,8	29	61,7
Mean	62,45		80,53	
SD	13,305		10,281	
Min-Max	40-100		65-100	

In the e-booklet intervention group, the pre-test assessment shows most of the participants' nutritional knowledge counts as 'enough' as many as 25 people (53,2%), while the post-test shows the majority counts as 'Good' as many as 29 people (61,7%).

Table 4. The Difference Between Pre-Test & Post-Test Knowledge in Video Intervention Group and E-booklet Intervention Group.

Group	Mean	SD	*P-Value*
Video			
Pre-Test	60,94	13,748	0,000
Post-Test	81,98	10,249	
E-booklet			
Pre-Test	62,45	13,305	0,000
Post-Test	80,53	10,281	

The test shows p-value of 0,000 indicating a significant difference between participants' nutritional knowledge before and after being given educational intervention in both video intervention group and e-booklet intervention group.

Table 5. The Difference of Effectiveness in Both Groups

Group	Mean	SD	P-Value
Video	81,98	10,249	0,350
E-booklet	80,53	10,281	

The test shows that there is no significant difference in terms of effectiveness in increasing nutritional knowledge between the video and e-booklet media

4. DISCUSSION

Characteristics of Respondents

The respondents ranged from 15 to 19 years old, with 53 students (55.8%) being dominated by the 17 years old group. One's age affects their maturity in understanding materials, according to research by Suwaryo & Yuwono (8), the older one gets, the more mature one's comprehension and mindset. In this study, the age of the respondents did not have a wide gap to show a significant difference in terms of knowledge. The sex of the respondents was dominated by women as many as 68 people (71.6%). The data shows that the frequency of female students is greater than that of male students. Thus, this data is in accordance with the current condition at SMK N 57 Jakarta because the school is dominated by female students. This is in line with research by Lathifa & Mahmudiono (9) that the majority of respondents are female.

The majority of respondents, 61 students (54.2%), had never received nutrition education before. These results are in accordance with a preliminary study on 10 student samples which shows that most students at SMKN 57 Jakarta have never received education about balanced nutrition. This is also in line with research by Felicia (10) which states that the majority of respondents of education-intervention research have never received education on balanced nutrition before. Exposure to previous education could certainly affect knowledge, respondents who have been exposed to education or information before carrying out the pre-test have a greater chance of having a better level of knowledge (11).

The latest education of fathers and mothers were dominated by the high school group, with 50 respondents (52.6%) for each category. This is in line with research by Zulaekah et al. (12) which stated that the majority of nutrition education research respondents had parents with advanced education levels. According to Reskianti's research (13), parents with higher education have a greater chance of implementing better parenting styles compared to parents with lower education. This parenting style then influences the child's knowledge in the future. The majority of the respondents' fathers worked as employees as many as 38 people (40.0%). In accordance with research by Nurmasyita et al (14) states that the majority of respondents have fathers who work as private employees. While the majority of respondents' mothers did not work, as many as 60 people (63.2%). This is in accordance with research by Elfira et al. (15) which states that the majority of respondents have mothers who work as housewives. Parents' occupation is one of the factors with a direct impact on the family's socio-economic conditions, according to Novianto (16) the socio-economic conditions of the family have an impact on the learning process and knowledge of an individual.

The characteristics of the income of the two respondent's parents were dominated by < IDR 4,453,935 (below Jakarta's minimum wage), on the father's income of as many as 55 students (57.9%), and on the mother's income as many as 78 students (82.1%). This is not in line with the research of Zulaekah et al (12) which stated that the majority of the respondent's parents had an income above the local minimum wage. Parental income is also part of the family's socio-economic factors, low parental income tends to result in a lower level of individual knowledge, this is mainly related to the child's study time which tends to be used to seek additional family income (16).

Data Distribution

In the video intervention group, the nutritional knowledge pre-test was dominated by the Less category as many as 23 people (47.9%). Meanwhile, the post-test data was dominated by the Good category as many as 34 people (70.8%). This result is in accordance with research (5) which stated that respondents in the video group had lower knowledge before the intervention than knowledge after the intervention, so there was evidence of an increase in the level of knowledge of the respondents after giving the intervention using video media.

In the booklet intervention group, the pre-test score is dominated by the sufficient category in nutritional knowledge of 25 people (53.2%). Meanwhile, the post-test data was dominated by the Good category as many as 29 people (61.7%). This is in accordance with research by Asshidiq et al (17) which stated that respondents in the booklet group had lower knowledge before the intervention than knowledge after the intervention, so there was evidence of an increase in the level of knowledge by providing education using e-booklet media.

Pre & Post Test Difference

Based on the results of the Wilcoxon test in the video intervention group, p-value = 0.000 (α <0.05) was obtained, so it can be concluded that there was a significant difference between knowledge before and after giving the intervention using video media. This increase in knowledge can be influenced by the appearance of the media based on the results of the media test, most of the respondents stated that the video media used was very interesting and very useful for understanding balanced nutrition guidelines points. This media is equipped with attractive visual and audio displays that catch the interest of respondents to listen and absorb the material provided. The increase of nutritional knowledge through providing interventions in the form of videos is in line with research (5) (p-values= 0.000). This is also in line with Hidayah's research (18) which states that there is a significant difference (p-value 0.001) between knowledge before and after providing a balanced nutrition intervention using video media. Wilcoxon test results also show p-values=0.000 (α <0.05) in the e-booklet intervention group, it is known that there is a significant difference between the level of knowledge before and after giving the intervention in the form of education using e-booklet media. This increase in knowledge was influenced by the level of attractiveness of the e-booklet media, based on the results of the media test, most of the respondents stated that the e-booklet media provided had a very attractive appearance and was very useful in helping to understand the message of balanced nutrition. Just like video media, e-booklet materials are also given in three continuing days so that respondents don't feel bored and have enough time to understand the material provided. This result is in accordance with Setyawati & Herlambang's research (19) with p-values=0.0001 in the group that was given education using e-booklet media. This is also in line with research by Asshidiq (17) who said that there was a statistically significant increase in knowledge (p-values<0.05) in the group of teenagers who were given education using e-booklets.

Video and E-booklet Effectiveness Comparison

Based on the Mann-Whitney non-parametric test results above, the results are obtained p-values= 0.350 (p-values>0.05) which means that there was no significant difference between the level of balanced nutrition knowledge of adolescents in the e-booklet and video media intervention group after the treatment. This insignificant difference is

caused by several things, the first is based on the results of media tests by 20 non-respondents, the majority of respondents gave very interesting and very useful assessments in helping to understand balanced nutrition messages for both media. So that there is no imbalance in terms of appearance and also the usefulness of the two media. Furthermore, both media are digital media that are easily stored and can be accessed at any time. In line with this research, the two media were statistically proven to be able to increase nutritional knowledge in adolescents, but the two did not have a significant difference (20).

5. CONCLUSION

There are differences in the level of balanced nutrition knowledge of respondents before (mean 60.94) and after (mean 81.98) providing interventions in the form of nutrition education using video media with p-values=0.000 (p-values<0.05). There was an increase in respondents' knowledge of balanced nutrition before (mean 62.45) and after (mean 80.53) providing interventions in the form of nutrition education using E-booklet media with p-values=0.000 (p-values<0.05). And there is no difference in the effectiveness of E-booklet and Video media in increasing knowledge of balanced nutrition in adolescents at SMKN 57 Jakarta and p-values=0.350.

The lack in this study is that the population and sample taken still small compared to the amount of adolescents in Jakarta, and the data was taken via online procedures. Future research can be considered to enlarge the samples and population and also improve the education media.

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