

THE EFFECT OF NUTRITION EDUCATION MY PLATE BASED ON HALAL FOOD THROUGH MOTION GRAPHIC ANIMATION AUDIOVISUAL MEDIA ON THE KNOWLEDGE AND ATTITUDES OF ADOLESCENTS

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ABSTRACT

Background: Indonesian adolescents encounter a triad of malnutrition: undernutrition, obesity, and micronutrient deficits. Knowledge and attitude significantly influence the resolution of nutritional issues. Enhancing nutritional awareness, particularly regarding halal food, can be achieved through early nutrition education. Motion graphic animation videos serve as an effective educational medium, offering appealing visual benefits that enhance student participation.. **Objective:** This study aims to determine the effect of halal food-based nutrition education through animated audiovisual media on adolescents' knowledge and attitudes related to nutrition. **Method:** The study used Quasy Experimental Pre-test and Post-test group design. The sample was divided into experimental and control groups, with a pre-test, intervention, and post-test process. The sampling technique used purposive sampling. The research sample consisted of two groups with a total of 112 people, in each group there were 56 people. The variables measured involved adolescents' knowledge and attitudes related to halal food-based nutrition. Data analysis used the Wilcoxon test to test changes within groups, and the Mann-Whitney test to compare differences between groups. **Results:** nutrition education my plate based halal food with motion graphic audiovisual media significantly increased knowledge ($p=0.000$) and improved attitudes ($p=0.000$) in adolescents. Motion graphic animation videos and video descriptions indicate a significant difference in their impact on knowledge ($p=0.003$), while no significant difference is observed regarding attitudes ($p=0.554$). **Conclusion:** Significant improvements in knowledge and attitudes were observed through the use of motion graphics and descriptive audiovisual media. Motion graphic media is more effective in enhancing knowledge, whereas its impact on attitude remains unchanged.

Key words : Educational Media, Halal Food, Knowledge, Attitude

INTRODUCTION

The rapidly developing lifestyle of adolescents has an impact on adolescent eating habits by consuming fast food and tending towards a sedentary lifestyle (Meidiana et al. 2018). Adolescents in Indonesia currently face three nutritional burdens (triple burden of malnutrition), which include malnutrition, overweight or obesity, and micronutrient deficiencies (Iriyani K 2020). Knowledge and attitudes are elements that might affect nutritional issues, particularly the lack of knowledge and attitudes leading adolescents to select inappropriate nutritious foods. (Ramadhanti et al., 2022).

According to WHO in 2016, Indonesian teenagers aged 10–19 years who were thin or malnourished were 10.4%, overweight were 14.20%, and obese were 4.9% (World Health Organisation, 2023). Based Indonesian Health Survey 2023 In Central Java, adolescents aged 13–15 years experienced thinness (5.7%), overweight (11,5%) and obese (3,7%) (Kemenkes, 2023).

Adolescence is regarded as a phase of self-preparation that integrates moral principles, faith, and knowledge (Amalia 2021). Adolescents must comprehend nutrition to enhance their knowledge and attitudes regarding dietary habits and healthy lifestyles from a young age. This can enhance health quality in adulthood, necessitating interventions through specialised education for adolescents (Kusumawardani et al., 2022).

One visualisation of balanced nutrition messages is “My Plate”, which illustrates the serving sizes of food and drinks at each meal. The general guidelines for balanced nutrition define that meal composition should include rice, side dishes, vegetables, and fruits, which are inherently nutrient-dense. The food items utilised must adhere to halal standards, necessitating instruction regarding halal food products.

According to Purpasari (2020), a study performed by the Good News From Indonesia (GNFI) community in 2020 revealed that 72% of 300 young Indonesian respondents were optimistic about the advancement of science. However, no one is currently excluded from the halal lifestyle (Tariqul and Putri 2021). The significance of raising awareness of halal food-based nutrition; early nutrition education can help achieve this (Mahmudah 2019).

According to research by Alfiah Rahmati et al. (2021), audiovisual media has the potential to increase knowledge and shift attitudes in a more positive direction. This is due to a cognitive factor or knowledge that functions as a factor in forming speech (Alfiah Rahmawati, et.al 2021). The audiovisual medium consist of both visual and auditory elements that assist students in understanding, memorising, and applying the relevant information (Nurfadhillah et al., 2021).

Motion graphic animation videos are an alternative audiovisual medium that is currently emerging. They combine elements of time-based visual media, including 2D and 3D animation, film, typography, video, illustrations, and music (Ismianti et al. 2022). These videos are visually appealing and can pique viewers' interest in learning (Mashuri 2020). The aim of this study is to enhance fundamental understanding about the components of halal food. Animated audiovisual media is used to develop more varied educational media.

METHOD

The research design used is Quasi Experimental pre-test post-test group design. The independent variables in this study are motion graphic animation, audiovisual educational media, and descriptive audiovisual media. The dependent variables in this study are knowledge and attitudes.

This research was conducted at MTSN 03 Sukoharjo and implemented from October 2023 to February 2024. The population taken were students aged 12–15 years with a sample size of 112 samples, which were divided into 2 groups. The first group is the control group, namely the description video and the second group is the control group, namely the motion graphic animation. The intervention is carried out for a period of one day, and the video that is played lasts for a total of 45 minutes.

The inclusion criteria for this study are as follows: students of MTSN 03 Sukoharjo aged 12–15 years that are willing to participate as research respondents, possess excellent communication skills, and have never received any education regarding the contents of their plate in relation to halal cuisine. The exclusion criteria for this study are respondents who are not present when sampling and do not participate in all series of research activities of respondents who have limitations such as being deaf, blind, and others.

The media content is divided into 3 parts, namely the opening, content and closing. The opening contains about Definition of my plate, History of my plate, Introduction to Rasulullah-style eating, introduction to the portion of my plate. The core material consists of prophet's eating recommendations, sugar, salt and oil consumption recommendations, water consumption per day, halal food and healthy lifestyle Rasulullah.

Audiovisual Media Motion graphic animation made with after effects application on the third party by adding sound by dubbing method and giving 3D effect and adding images made with adobe illustrator application on each scenario in the video. The video has a 16:9 ratio in the form of a landscape, added with a song as accompaniment. Audiovisual decryption media: created using the canva application.

The video was made with a 16:9 ratio. Video description is a video that only contains text and images which are then added with additional song instruments as accompaniment. In each media, the intervention was carried out for 45 minutes and a question and answer session was held for 15 minutes, followed by conducting a posttest to determine the results of the intervention that had been carried out.

This study has received approval from the Health Research Ethics Committee of Dr. Moewardi Regional General Hospital, Surakarta, in accordance with the Decree of Ethics Review Number: 117/I/HREC/2024. The instrument used in this study was a questionnaire that had been tested for validity with a correlation value of >0.312 on knowledge and attitudes, with 14 questions about knowledge and 11 questions about attitudes. The results of the reliability test in this group also showed an alpha value of 0.700 on knowledge and 0.540 on attitudes.

Questionnaires regarding knowledge questions in the form of multiple choice, with a total of 14 questions and 11 questions about attitudes related to the nutrition material of my plate based on halal food. In knowledge questions, if the question is correct, it will get a score of 1 and if it is wrong, it will get a score of 0. A normality test using Shapiro-Wilk showed that the pre-test and post-test data were not normally distributed. In each intervention and control group, the Wilcoxon test was used to determine the effect of nutrition education on the knowledge of adolescents. Differences in the effectiveness of media influences on knowledge and attitudes were tested using the Mann-Whitney test.

RESULTS AND DISCUSSION

Characteristics of Respondents

The study showed that the sample size in the motion graphic video and description video categories for both genders, female and male, was relatively balanced. In the experimental group, the majority of respondents were male, reaching 55.4%, while in the control group, the majority were female with the same percentage, namely 55.4%.

Adolescence is an age group that is in a phase of rapid growth. Changes in body composition affect nutritional needs in adolescents. Male adolescents need

more nutrients than female adolescents due to differences in types of activities, hormonal influences and body composition (Dewi 2013). The results of the study with samples aged 12 to 15 years. Adolescence is a very important period in human life, because the initial process of maturity of thinking occurs. The transition period from childhood to adulthood. Ages 10-15 years are classified as early adolescence (Herwandar 2021).

Table 1. Respondent characteristics

Characteristics	Animation Video <i>Motion graphic</i>		Video Description	
	n	%	n	%
Gender				
Male	31	55.4	25	44.6
Femele	25	44.6	31	55.4
Age				
12 Year	8	14.3	7	12.5
13 Year	28	50	26	46.4
14 Year	18	32.1	20	35.7
15 Year	2	3.6	3	5.4
Class				
Grade 7	25	44.6	27	48.2
Grade 8	31	55.4	29	51.8
Pocket money				
< Rp 10.000	24	42.9	24	42.9
Rp10.000- Rp15.000	30	53.6	25	44.6
> Rp 15.000	2	3.6	7	12.5
Total	56	100	56	100

Early adolescents need increased knowledge and the formation of positive attitudes towards food. Knowledge obtained early on can influence attitudes, then attitudes can influence behavior (Azhari and Fayasari 2020). The average of the largest samples was in class 3, namely 50% in the experimental group and 46.4% in the control group. Most of the samples were taken from class 8 with a

percentage of 55.4% in the experimental group and 51.8%.

In the experimental and control groups, the largest pocket money is Rp10,000 to Rp15,000 per day. Based on Putri's research (2017), the amount of pocket money is closely related to the selection of types of snacks consumed. Teenagers who are given a large enough pocket money usually often consume modern foods with consideration and hope

of being accepted among their peers. The freedom to choose their own food will make teenagers tend to buy whatever they like or what they find interesting without considering whether the food is nutritionally balanced or not (Putri, 2017).

The Influence of Audiovisual Media on Changes in Adolescents' Knowledge in Adolescents

Based on Table 2, the results of the knowledge category analysis in the motion graphic group with a total of 56 respondents showed a significant increase. Before the intervention, the highest knowledge score was 71.4, which increased to 100 after the intervention. Meanwhile, in the descriptive media group with the same number of respondents, there was a similar change. Before the intervention, the highest knowledge score was 71.4, which increased to 100 after the intervention. There is a significant difference in knowledge before and after the intervention using motion graphics and video description ($p < 0,005$). This study is in line with research (Sutrio and Yuniato, 2020) the average result of increasing knowledge in the intervention group with video, the value before the intervention was 27.06 and increased when given the intervention to 79.2. Significantly, video is

the intervention group that has a higher value in increasing knowledge (Sutrio and Yuniato 2021).

Video animation integrates sound, text, and graphics. This is an exceptionally engaging, effective, and efficient medium for facilitating the comprehension of the material Animation media may serve as a viable tool to enhance the learning process, as it can render abstract concepts tangible and potentially augment students' concentration (Ayuningsih, 2017). Nutrition education with animated videos positively impacted the nutritional knowledge of adolescents. the average nutritional knowledge before the intervention in the animated video group was 15.79, which climbed to 20.14 following the intervention. The results of the study show that animated video medium significantly enhances the effectiveness and efficiency of the nutrition teaching process, hence augmenting knowledge acquisition. The video animation pertains to nutritional content, encompassing sources of nutritious food, dietary taboos and abstentions, balanced nutrition, and diseases affecting teenagers. This knowledge is essential for every adolescent to establish sound nutritional habits (Masitah et al, 2020).

Table 2. The Influence of Audiovisual Media on Changes in Adolescents' Knowledge Before and After Education on the Contents of My Plate Based on Halal Food

Variables	n	Knowledge		p value
		Before	After	
		min-max	min-max	
Motion Graphic	56	21,4-71,4	42,8-100	0.000
Video Description	56	14,2-71,4	42,8-100	0.000

The Influence of Audiovisual Media, Motion Graphic Animation and Descriptive Media on Attitudes in Adolescents

Based on Table 3, Before the intervention, the highest attitude score in the motion graphic group was 38, increasing to 39 after the intervention. Meanwhile, in the descriptive media group, the highest attitude score before the

intervention was 40, increasing to 41 after the intervention. The findings in the field were that some students seemed to answer randomly and did not read the question carefully. This research is in line with the research of Ramadhanti et.al (2022), the difference in attitude scores was seen after being given nutrition education, there was an increase in attitude scores in the experimental group with an average score before 76.46 then increased to 86.61. A good attitude is obtained from good knowledge. Attitudes play a role in changing poor practices and behaviors.

This study is in line with Hartaty et, al (2022) before the intervention the lowest value was 19 and the highest was 38, after the intervention the value increased, namely the lowest value was 24 and the highest value was 40. Therefore, the level of nutritional knowledge in a person can affect nutritional attitudes. If nutritional knowledge is high, it will tend

to make the respondent behave well in nutrition (Hartaty, et.al, 2022). In the comparison of media effectiveness, the results obtained p value > 0.05 statistically there is no significant difference between the use of motion graphic educational media or video descriptions in increasing attitude values. This can occur because the research time is only 1 day so that the increase in attitude values has effect. Health education is considered a long-term behavioral investment because the results obtained can only be seen several years later. While the short-term results only involve changes in knowledge. Behavioral change generally takes 18 to 154 days (Seki and Fayasari 2019). The use of learning media in the teaching and learning process can arouse new desires and interests and help the effectiveness of the learning process and the delivery of messages and learning content (Ramli 2021).

Table 3. The Influence Audiovisual Media on Changes in Adolescents' Attitudes Before and After Education on the Contents of My Plate Based on Halal Food

Variables	n	Knowledge		p value
		Before	After	
		min-max	min-max	
Motion Graphic	56	29-38	31-39	0.005
Video Description	56	28-40	28-41	0.004



Figure 1. Control Group Educational Media



Figure 2. Intervention Group Educational Media



Figure 3. Halal Food Education

The Effectiveness of Nutritional Education Between Motion Graphic Videos and Videos in Theses On Increasing Knowledge And Attitudes In Adolescents

The mann whitney test in table 4 shows that in the mean rank points, the results are motion graphics 65.58 and descriptions 47.42. The mann whitney test results p value = 0.003. Because the p value is <0.05, statistically there is a significant difference between educational media of motion graphic animation video and description video. Looking at the mean rank results, motion graphic animation videos are classified as more effective compared to description videos. This study is consistent with research (Sutrio and Yuniato, 2020), which found that the

average improvement in knowledge in the intervention group with video was 27.06 before the intervention and increased to 79.2 after the intervention. Significantly, video became the intervention group with the highest value for developing knowledge (Sutrio and Yuniato, 2021).

The improvement of cognitive ability is mostly influenced by the efficacy of the learning media . Video animation educational media can concurrently impart knowledge through integrated visual and auditory components. Audio-visual presentations can enhance students' comprehension of abstract concepts. Video animation can engage pupils and enhance their motivation to learn.

Video animation can effectively enhance the learning styles of auditory

and visual pupils. Video animation enables students to obtain knowledge tailored to their specific learning preferences. The evaluation of animated video learning materials is based on a number of variables, including the material's quality, learning design, language, typography, and relevance to the syllabus (Mayer and Moreno, 2002). Functions and advantages, visual and aural features of media, language and typographic aspects, and programming aspects are some of the assessment indicators used to evaluate learning media. Video efficacy, video aesthetics, video usefulness, video display, and video duration are all factors that users teachers and students consider when

evaluating a product (Rashid, Khanum and Khan, 2024).

According to Mardhiah et al. (2020), providing nutrition instruction in the form of words is less beneficial (Marlina 2019). The usage of audiovisual material, both descriptive and motion graphics, has a relatively short duration of 5 minutes. According to (Ismianti et al, 2022), depicting information simply and meaningfully with animation and audio makes it easier for respondents to understand the information provided, and it can stimulate both senses, namely sight and hearing, so that this process can arouse respondents' interest, thereby accelerating the understanding process (Ismianti et al. 2022).

Table 4. Differences in the effectiveness of nutrition education based on the contents of my plate between motion graphic videos and descriptive videos on increasing knowledge and attitudes

Indicator	Group	Mean Rank	p value
Knowledge	Motion Graphic	65.58	0.003
	Video Description	47,42	
Attitudes	Motion Graphic	54.70	0.554
	Video Description	58.30	

The Mann Whitney test explains the effectiveness of both educational media in improving attitudes. Table 4 shows that at the mean rank point, the results of motion graphics were 54.70 and descriptions were 58.30. The results of the Mann Whitney test obtained a p value = 0.554. Because the p value > 0.05, statistically there is no significant difference between educational media, animated motion graphic videos and descriptive videos in improving attitude values. This can occur due to the research time of only 1 day so that the increase in attitude value is less influential. Education on health is considered a long-term behavioral investment because the results obtained can only be seen

several years later. While the short-term results only involve changes in knowledge

Behavior change generally takes 18 to 154 days. use of learning media in the teaching and learning process can arouse new desires and interests and help the effectiveness of the learning process and the delivery of messages and learning content.

A person's attitude can be formed by paying attention to sufficient time to understand information. Factors that can influence a person's attitude are personal experience, the influence of others, culture, emotional and environment. In line with research (Mahmud, Ambarwati and Mintarsih, 2017) the results showed a change in

the average attitude score of 3.7. However, if tested using an independent T-Test, the value is obtained ($p = 0.083$) which indicates that there is no effect of education with audiovisual media on attitudes about balanced nutrition. The intervention carried out in the study when carried out only once, it can be one of the factors of relatively fewer attitude changes. Interesting and interactive educational media can motivate adolescents to learn and increase their knowledge and help adolescents to seek the latest information more interestingly, this media produces visually and audibly helpful movements, sounds and images that can be clearly recorded in adolescents' memories (Shabrina Dinnisa et al., 2023).

According to Azhari and Fayasari, (2020) attitude change is much more difficult than knowledge change. Video or audiovisual media is better at transferring information than other media, especially in terms of knowledge than in attitudes. So it can be concluded that audiovisual educational media motion graphic animation can help in increasing the value before and after both knowledge and attitude. However, the effectiveness of motion graphic animated audiovisual educational media is more effective in increasing knowledge compared to attitudes. According the research of Ramadhanti et al. (2022) that differences in attitude scores were seen after being given nutrition education; there was an increase in attitude scores in the experimental group with an average score before of 76.46 then increasing to 86.61. A good attitude is obtained from good knowledge. Attitude plays a role in changing bad practices and behaviors (Ramadhanti et al., 2022).

The limitation of this research is that the creation of media carried out with a third party makes some scenes in the video less interesting and too difficult to revise. In addition, the provision of education for attitudes that is only carried out for 1 meeting is less effective, it might be more effective if the material is applied to everyday life.

CONCLUSION

There is a significant difference ($p=0.003$) in knowledge between motion graphic animation and description audiovisual media. Motion graphic animation video (mean rank 65.58) is more effective than description video (mean rank 47.42).

There is no significant difference ($p=0.554$) in attitude between motion graphic animation (mean rank 54.70) and description video (mean rank 58.30). Both media do not show significant differences in effectiveness in influencing attitudes.

SUGGESTION

It can be an important contribution to academic research to cover the use of animated motion graphic videos that are effective in increasing knowledge and presenting information.

Respondents should consider the use of animated motion graphic videos as an effective learning tool. It is recommended to provide materials in more than one meeting and combine them with games to strengthen the concepts and increase positive attitudes towards the material.

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