

## The Effect of Animated Media on Knowledge and Attitudes Regarding Physical Activity

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### ABSTRACT

**Background:** There is an increasing prevalence of obesity, and lack of physical activity is the cause of changes in physical activity patterns. Educating children about physical activity is necessary to increase knowledge and change their attitudes and behavior. The media that can be used is animation media. **Objective:** This study aims to describe the behavior and effect of animated media regarding changes in knowledge and attitudes towards physical activity for 8<sup>th</sup>-grade students. **Methods:** A quasi-experimental study with a non-equivalent control group using 51 samples from JUNIOR HIGH SCHOOL Wahidin Cirebon and JUNIOR HIGH SCHOOL 220 Jakarta and proportioned stratified random sampling. The variables were knowledge and attitudes. The animation media for the control group was from the Ministry of Health, while for the intervention group was created by researchers from the Australian Government (Department of Health) (2019) and the U.S. Department of Health and Human Services (2008). The sample's criteria included having a stable signal and Gmail, being able to use Google Meet, and filling out the pre-test and post-test. Data collection was in one day on April 22<sup>nd</sup> 2021, for Junior High School Wahidin Cirebon, and June 2<sup>nd</sup> 2021, for Junior High School 220 Jakarta using Google Form with 29 questions. Data analysis used T-Test Independent, Wilcoxon, and Mann-Whitney. **Results:** The average knowledge scores in control group with animated media from Ministry of Health during pre-test and post-test were 61.00 and 66.00, while intervention group with researcher's animation media during pre-test and post-test were 69.68 and 84.52. The average scores of attitudes in control group during pre-test and post-test were 86.03 and 78.26, while intervention group during pre-test and post-test were 78.77 and 87.73. Positive behavioral descriptions for control group and intervention group were 55% and 48.4%. **Conclusion:** The results showed a change in knowledge and attitudes after intervention for the intervention group and the opposite for the control group. Animated media about physical activity can be used as an educational media because it has more effect on increasing knowledge and attitudes than comparison animation media. Suggestions for further research consist of adding behavioral change variables and intervention more than once during the study.

**Keywords:** Animation Media, Attitudes, Knowledge, Physical Activity

### INTRODUCTION

The prevalence of overweight children aged 13-15 in West Java is 12%, and obese is 4.9%. Overweight children in DKI Jakarta are at 15.1%, and obese at 10%. According to the types of residence, city regions have a higher number of overweight and obese than village regions. In Indonesia, the highest prevalence of lack of physical activity is in the West Java province, 37.5%, while in DKI Jakarta, 47.8%. In the age category, the highest number with a lack of physical activity is among those aged 10-14 at 64.4% (Riset Kesehatan Dasar, 2018).

The increase in the prevalence of overweight and obese children with a lack

of physical activity is caused by changes in physical activity patterns. Children being busy with their gadgets increases their sedentary behavior, whereas obesity risks in children also increase (Zamzani, Hadi and Astiti, 2017). Imbalances in intake and exertion of energy increase obesity risks. Physical activity may change body composition, which means increasing body mass without excessive fats and reducing body fats. Further research on the relationship between obesity and cognitive function is still needed; however, indirect effects of obesity, namely diseases in obese children, are expected to reduce cognitive function.

Doing physical activity is necessary for adults and children as it can reduce morbidity risks such as obesity, overweight, and other diseases caused by excessive body weight, such as type 2 diabetes mellitus, coronary heart diseases, stroke, cancer, high blood pressure, and bone abnormalities (Utami, Hatijah and Shofiya, 2016). Physical activity can also improve one's psychology by reducing stress, anxiety, and depression (Saleh, 2019).

Aside from health, physical activity can affect children's confidence levels in early adolescence. Children have started to pay attention to their body shape during this period; hence it will result in effects on their confidence levels (Saleh, 2019). The benefits of physical activity can be achieved with support from surrounding environments, such as school. For that reason, schools are advised to hold physical activity sessions every day for 60 minutes with medium intensity, time division can be adjusted so it will not hinder other school activities, but students still do physical activity as they should.

Providing education on physical activity requires using appropriate media or tools to facilitate children's learning process to achieve learning goals. According to Piaget's theory that explains children's mental development theory, the age of 12 and above are included in the formal operational phase category where children can understand argument forms, not get confused by argument sides, and can use concrete operations to form more complex operations. Media function becomes important when every ongoing learning needs a theory application that can be understood easily and does not require much cost (Fathurohman, *et al*, 2015). Children favor animated films because their character visualizations are interesting, full of color, have simple plots, and are easy to accept by children.

In line with that, improving knowledge and attitude on physical activity for junior high school students using animated media through this research is needed to know the description of behavior and effects of animated media regarding the change in knowledge and attitudes toward physical activity for junior high school students.

## METHODS

This research had obtained a permit from the Ethics Research Community of Esa Unggul University no. 0127-21,127/DPKE-KEP/FINAL-EA/UEU/V/2021. It was conducted online; the data collection was through Google Form with questions related to physical activity amounted to 29 questions; 10 about knowledge, 9 about attitudes, and 10 about behavior. Questions about knowledge discussed the definition and time of physical activity, screen time outside online learning hours, examples of physical activity, good effects, and bad effects of the lack of physical activity. For questions about behavior, they discussed whether respondents agreed or disagreed with doing physical activity and exercising rather than laying down, watching tv, playing with cell phones, not exercising because of overweight problems, and not exercising because it was tiring. For questions about behavior, respondents were given questions with choices of always, often, sometimes, seldom, and never. The questions were respondents did physical activity daily, exercise 3 days a week and every weekend, miss exercise time because they did not get to do it, play with cell phones for less than 2 hours, feel an elevated mood after exercising, sweat after exercising, and exercise with friends.

Respondents were at their respective homes due to the pandemic, and the time of research was April 22nd, 2021, for Junior High School Wahidin Cirebon, and June 2nd, 2021, for Junior High School 220 West Jakarta, focusing on 8<sup>th</sup>-grade students. The type of research was quantitative research with the experimental method, and the research design was quasi-experimental with non-equivalent control groups and comparing control groups with intervention groups, then oversaw the results of pre-test and post-test of research subjects.

The data collected in this research were primary data sourced from the students who became the research samples, and secondary data regarding the schools sourced from the schools' archives. The population in this research was all 8<sup>th</sup>-grade students of Junior High School Wahidin Cirebon, which amounted to 32 students, and Junior High School 220 West

Jakarta, 248 students. Calculation of the samples was done using previous research's average difference test formula as follows:

$$\sigma^2 = \frac{[(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2]}{(n_1 - 1) + (n_2 - 1)}$$

$$n = \frac{2\sigma^2 [z_{1-\alpha/2} + z_{1-\alpha/\beta}]^2}{(\mu_1 - \mu_2)^2}$$

According to the results above, each sample size for the control and intervention groups was 20 students. After data cleaning, the results obtained 9 students of Junior High School Wahidin Cirebon in the control group and 15 in the intervention group. For Junior High School 220 West Jakarta, the control group contained 11 students and the intervention group 16 students. The total research samples for the control groups amounted to 20 students, and for the intervention groups was 31.

The inclusion criteria of the samples in this research consisted of 8<sup>th</sup>-grade students of Junior High School Wahidin Cirebon and Junior High School 220 West Jakarta, and samples did not have serious problems (color blind, blind, deaf) in hearing and sight senses, samples were healthy and did not disturb other students' concentrations, samples owned a good wi-fi or cellular network, samples had sufficient internet quota, samples understood and owned an email to join an online Google Meeting, samples followed the research to the end (filled out pre-test, watched the video, filled out post-test). For the exclusion criteria, samples only filled out pre-test or post-test, and samples only saw the animated video without filling out the questionnaire.

In the control groups, samples were given education using an animated media from the Ministry of Health; meanwhile, the intervention groups received an animated media made by the researcher sourced from the Australian Government (Department of Health) (2019) and United States Department of Health and Human Services (2019). This research was carried out in one day with the provision of intervention one time, and the data collection of pre-test and post-test was done on the same day, including knowledge and attitudes on pre-test and post-test questionnaires. The questionnaires had been tested for validity

and reliability and thus were appropriate to be used.

In this research, a normality test was done using the Kolmogorov Smirnov, Skewness, and Histogram tests. Results showed that the pre-test and post-test for knowledge in the control groups had a normal distribution. Meanwhile, the pre-test and post-test for attitudes in the control groups and also the pre-test and post-test for knowledge and attitude in the intervention groups had an abnormal distribution. A homogeneity test using the Independent T-Test showed a p-value of 0.114. The conclusion was p-value > 0.05, meaning the data variants were the same or homogenous. Comparison between the knowledge before and after the intervention in the control groups used the Dependent T-Test and Wilcoxon test in the intervention groups, and also for attitudes in the control groups. In contrast, comparison between the control and intervention groups used the Mann-Whitney test.

## RESULTS AND DISCUSSION

Table 1. Respondents' Characteristics

Respondents' Characteristics	Control		Intervention	
	N (20)	%	N (31)	%
<b>Junior High School Wahidin Cirebon</b>				
Male	4	44.4	4	2.7
Female	5	55.6	11	73.3
<b>Junior High School 220 Jakarta</b>				
Male	2	18.2	5	31.2
Female	9	81.8	11	68.7

Table 1 shows that most respondents were females in the control and intervention groups, and most were from Junior High School 220 Jakarta as many as 27 students. In terms of groups, the

majority were from the intervention group, which was 31.

**Description of Physical Activity Behavior**

Table 2. Behavioral Interpretation of Physical Activity of the Control and Intervention Groups

Group	Category	N (20)	Percentage (%)
Control	Positive	11	55
	Negative	9	45
Intervention	Positive	15	48.4
	Negative	16	51.6

According to the research results, 11 respondents in the control groups had positive behavior, while 9 had negative behavior. Analysis results in the control groups show that 5 respondents always did a physical activity, 2 often, 9 sometimes, and 4 seldom. This was in line with previous research, which stated that respondents mostly did mild physical activities than strenuous ones, like sitting, while studying or during break time; and used motor vehicles, which hindered children from moving more often (Atika Maulida, *et al*, 2017).

Other causes were that the COVID-19 pandemic required students to do their tasks at home and perform physical distancing, which made them not go outside. During the COVID-19 pandemic,

society had a decrease in physical fitness and an increase in body weight due to the limited room to move (Srivastav *et al.*, 2021).

A research statement in 2021 stated that the COVID-19 pandemic required children to study at home, so schools had a hard time monitoring children’s activity (Sitoayu *et al.*, 2021). The same went for exercising; in the statement for that, it was shown that the respondents were not sufficiently active in exercising according to the questionnaire answer results.

Previous research mentioned that online learning required children to stay still in front of a cell phone or computer and not do much moving, leading them to have a sedentary lifestyle, which might cause reduced immunity and bad effects on their health (Khotimah & Wahjuni, 2021).

According to table 2, 15 respondents had positive behavior, while 16 had negative behavior. Analysis results in the control groups showed that 2 respondents always did a physical activity, 7 often, 19 sometimes, and 3 seldom. This was in line with the control groups that adolescents tended to lack in physical activities, one of the causes would be social media that made them lazy to move (Setiawati *et al.*, 2019).

**Knowledge Before and After the Intervention in Control Groups**

Table 3 Univariate Results of Knowledge and Attitudes in the Control and Intervention Groups.

Variable	Group		Value	Mean ± SE	Minimum	Maximum
Knowledge	Control	Pre-test	61.00	61.00±4.22	10	80
		Post-test	66.00	66.00±3.86	40	90
	Intervention	Pre-test	69.68	69.68±2.98	20	90
		Post-test	84.52	84.52±2.53	50	100
Attitudes	Control	Pre-test	86.03	86.03±4.25	22	100
		Post-test	78.26	78.26±4.99	11	100
	Intervention	Pre-test	78.77	78.77±2.43	44	100
		Post-test	87.73	87.73±2.32	44	100

Table 3 shows that the average score for knowledge of the control groups before the intervention was 61.00, while after it was 66.00. For the average score for attitudes before the intervention was 86.03, while after it was 78.2. Analysis results showed no significant increase

before and after the provision of animated media in the control groups. This was because the questions on the knowledge questionnaires were not fully explained in the animated media of the Ministry of Health.

The animated media for the control groups contained persuasions to do physical activities such as class pickets, then explained the bad effects if one did not do physical activities and the benefits of physical activities. The media did not explain the definition of physical activity, the differences between physical activity and exercise, and the time needed to do physical activity and exercise; thus, the respondents could not answer the knowledge questionnaires correctly. Regardless of the increased knowledge, the calculation did not show a significant increase.

In the pre-test results, questions about the time to do physical activity, time to exercise, screen time outside learning hours, and physical activity that could reduce anxiety and depression, resulted in more wrong answers than the correct ones. After receiving the intervention, there was an increase in the scores for the questions about the time to do physical activity and exercise also about physical activity that reduced anxiety and depression; however, the scores were still consistent for the 3rd question, which asked about the duration for cell phone usage outside learning hours.

On the question about screen time for children, the respondents' answers remained consistent; there was no

increase or reduction in the amount of correct and incorrect. This was because the animated media for the control groups did not talk about screen time for children. Thus, the respondents were consistent with their answers before the intervention.

According to the analysis results, the knowledge scores of the respondents before the intervention were mostly within enough category, followed by good and less, with the same percentages. After receiving the intervention, there was an increase in the good category from 30% to 45%. In line with the research of Ningrum (2021), who conducted research using animated media with short intervention (only provided once), which stated that there was an increase in the learning results of students using animated media.

The increased knowledge was caused by the provision of education or information through animated videos, also the increased curiosity and appeal of the respondents, thus resulting in better comprehension and understanding. Regardless of the increased scores, the increase was not significant because the animated media did not explain in detail about screen time outside online learning hours, time to do physical activity and exercise, definition and examples of physical activity, where these were these questions on the questionnaires.

Table 4. Comparison between Knowledge and Attitudes Before and After the Provision of Animated Media in the Control and Intervention Groups

Variable	Group	Score	P-value	α
Knowledge	Control	<i>Pre-test</i> <i>Post-test</i>	0.056	0.05
	Intervention	<i>Pre-test</i> <i>Post-test</i>	0.000	
Attitudes	Control	<i>Pre-test</i> <i>Post-test</i>	0.055	0.05
	Intervention	<i>Pre-test</i> <i>Post-test</i>	0.001	

The analysis results above show that the p-value in the knowledge of the control groups is 0.056, meaning there was no change in the knowledge before and after the provision of the animated media. **Knowledge Before and After the Intervention in the Intervention Groups**

According to table 3, it is known that the average knowledge score in the intervention group before the intervention

was 69.68, while after it was 84.52. The average score before the intervention was 78.77, while after it was 87.73.

The respondents mostly answered incorrectly on number 2 and 3 which talked about time to do physical activity and time to use cell phones outside learning hours. However, after receiving the intervention in the form of animated media, they mostly answered correctly. This was



because the animated media for the intervention group discussed the duration to do physical activity and screen time outside learning hours and these materials were on the question number 2 and 3. The respondents had an increase in scores for 7 questions, and the same scores for 3 questions.

After the provision of the intervention, there was an increase in the good category to 83.9%. The same went for previous research, which concluded that mathematical learning results might increase with the use of animated media in 8<sup>th</sup>-grade students (Nasir, 2021), and research in 2018 which concluded that there was an increased knowledge in female adolescents after receiving an education using animated media (Hartati & Yuniarti, 2019). An increased knowledge provided by formal and non-formal education may result in immediate impacts for the respondents (Widyawati and Maretty, 2020). Using animated media as learning media is highly useful in increasing learning effectivity and efficiency so the learning results will improve. Animated media that move, produce sound, and contrast colors appeal to children, thus developing positive spirits and impressions. As a result, the respondents will become motivated to pay attention and learn seriously.

In the intervention groups, there was a significant increase in knowledge scores compared to the control groups. This was because the animated media provided to the intervention groups explained the definition of physical activity, time to do physical activity and exercise, advantages, disadvantages, and examples of physical activities. Thus, the respondents could answer the questionnaires correctly. According to the analysis in table 2, the intervention groups had a p-value of 0.000 which means there was a change in the knowledge before and after the provision of animated media.

#### Attitudes Before and After the Intervention in the Control Groups

Table 5. Interpretation of Attitudes in the Control and Intervention Groups.

Interpretation	Score	Before (%)	After (%)
Control	Positive	80	75

Intervention	Negative	20	25
	Positive	38.7	77.4
	Negative	61.3	22.6

The research results on attitudes in the control groups from the pre-test statement number 1, “respondents prefer to lie down than do activities outside their houses”, produced more negative answers than positive ones. After being provided with the intervention, there was an increase and all statements produced more positive answers. The respondents had an increase in scores for 1 question, a decrease for 7 questions and static scores for 1 question. According to the analysis results on the interpretation of attitude in the control groups, 80% of the respondents showed a positive attitude but experienced a decrease after receiving the intervention to 75%.

#### Attitudes Before and After the Intervention in the Intervention Groups

There was an increase in attitudes of the intervention groups, which was proved by the decreased number of respondents with negative attitudes and an increased number of respondents with positive attitudes. The use of animated media creates an effective way of learning in a short time and results in the conclusion that something received through audiovisuals will last longer and be better in memory because it involves more of the five senses (Syakir, 2018). Sufficiently strong suggestions on attitudes will provide an affective basis in assessing something so that an attitude direction is formed, which is manifested through action.

#### Comparison of Knowledge and Attitudes in the Control and Intervention Group

The increase in positive attitudes was not in line with the analysis results of respondents' behavioral descriptions, where 51.6% of respondents showed negative behavior. This could be because the respondents had generated an inner response in the form of an attitude but had not provided a further inner response in the form of action. In addition, respondents had not made their knowledge a basis for action, so the knowledge and attitudes had shown a good response, but the action still showed a negative response. According to table 2, the intervention groups had a p-value of 0.001

with a value of  $\alpha = 0.05$ . It was concluded that there was a change in attitudes before and after the provision of animation media in the intervention groups.

Table 6. Comparison of Knowledge Scores in the Control and Intervention Groups

Variable		P value	$\alpha$
Knowledge	Control groups	0.000	0.05
	Intervention groups		
Attitudes	Control groups	0.124	0.05
	Intervention groups		

### Knowledge

According to the analysis results in table 4, there were significant differences in knowledge scores between the control group and intervention group. Animation is a nutrition education media that facilitates information delivery and message reception in education targets (Syakir, 2018). Learning media helps students understand the learning process better because it is more interactive and involves various senses, such as the senses of sight and hearing, so students will easily remember the material.

The lower score in the control group, which used a comparator animated media compared to the intervention group with animated media made by researchers, does not mean that the animation media was not good. Instead, the content of the animation media did not fully explain physical activity. This was also influenced by various factors, such as media facilities, the intelligence level of each respondent, and extrinsic factors like room condition.

### Attitudes

Table 3 shows no significant difference in the attitudes scores between the control and intervention groups; however, according to the average, there was an increase in the scores of the intervention groups, while the control groups had a decrease influenced by how far the content of communication or stimulus that was paid attention to, accepted and understood to obtain a positive response.

The void of a significant increase and difference in scores might have been caused by the main component that

formed an attitude was not met. Many factors may influence attitudes, such as personal experience, culture, other people considered important, mass media, etc.

### CONCLUSION

There was an increase in the knowledge and attitudes of the intervention groups compared to the control groups, and there was no increase in the knowledge and attitudes of the control groups. This research recommends research developments by adding different variables, such as behavioral change variables, paying more attention to the respondents' environment so they will be in a room with minimum distractions, giving an intervention more than once during the research period so the results will be clearer, animated media being included in between the shift of school subjects, and headmasters assisting the respondents to do physical activity and exercise online, like exercising together online every morning.

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