
THE EFFECT OF INFOGRAPHIC VIDEO MEDIA IN IMPROVING KNOWLEDGE AND ATTITUDES OF ELEMENTARY SCHOOL STUDENTS IN PALEMBANG CITY ON DIARRHEA PREVENTION

Estu Aulia^{1*}, Hendawati², Maliha Amin³, Faiza Yuniati⁴, Esti Sri Ananingsih⁵

^{1,2,3,4,5}Palembang Health Polytechnic of the Ministry of Health, South Sumatra, Indonesia

Corresponding author: auliaestu63@gmail.com

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ABSTRACT

Background: Diarrhea is one of the health problems that frequently occurs among elementary school children and can lead to serious consequences if not properly addressed. Preventive efforts through health education are essential, one of which is utilizing engaging and easily understandable learning media for children. This study aims to determine the effect of animated infographic video media on improving the knowledge and attitudes of third-grade students in an Elementary school. **Methods:** The research design used was a quasi-experimental design with a one-group pretest-posttest approach. The study sample consisted of 59 students selected using a total sampling technique. The instruments used were knowledge and attitude questionnaires that had been tested for validity and reliability. Data were analyzed using the Wilcoxon Signed Rank Test. **Results:** The study showed an increase in knowledge scores, with the mean pretest score rising from 12.54 to 18.14 in the posttest, as well as an increase in attitude scores from a mean of 44.88 to 48.61. **Conclusion:** Statistical tests showed a significant difference between the scores before and after the intervention, both in knowledge ($p = 0.000$) and attitude ($p = 0.000$). These findings demonstrate that animated infographic video media has a positive effect on improving students' knowledge and attitudes regarding diarrhea prevention.

Corresponding Author: Estu Aulia
auliaestu63@gmail.com Prodi
Pengawasan Epidemiologi,
Poltekkes Kemenkes Palembang,
South Sumatra, Indonesia

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INTRODUCTION

Diarrhea is a condition in which a person experiences increased bowel movements due to infection. A child is categorized as having diarrhea if the daily volume of stool exceeds 10 ml per kilogram of body weight. Generally, the stool has a watery consistency, contains a lot of fluid, and is passed more than three times a day (Anggraini & Kumala, 2022). Diarrhea can affect anyone, regardless of age, and can cause various symptoms such as fever, loss of appetite, abdominal pain, fatigue, and weight loss (Yohana et al., 2023).

According to the World Health Organization (WHO), diarrhea is one of the leading causes of death and illness in children worldwide. Each year, approximately 443,832 children under five die from diarrhea, plus an additional 50,851 children aged five to nine. Overall, nearly 1.7 billion cases of diarrheal disease in children occur worldwide each year. Most cases of diarrhea could be prevented with access to clean water and good sanitation, and hygiene (World Health Organization (WHO), 2024).

According to the 2023 Indonesian Health Survey, the incidence of diarrhea was recorded at 2% across all age groups, 4.9% for children under five, and 3.9% for infants. Furthermore, information from the 2018 Sample Registration System indicates that diarrhea remains a leading cause of death, with a rate of 7% in neonates and 6% for infants aged 28 days. In 2023, access to services for diarrhea patients of all ages reached 41.5%, while access for children under five reached only 31.7% of the target (Kementrian Kesehatan, 2016).

The prevalence of diarrhea in South Sumatra was recorded at 5% in 2018, while in toddlers in the same region, the prevalence reached 10.1% in 2019 (Kemenkes, 2018). According to information from the Central Statistics Agency of South Sumatra Province, the total incidence of diarrhea in South Sumatra Province in 2021 was 94,653 incidents, then decreased to 86,008 incidents in 2022, before rising again to 105,978 incidents in 2023 (Badan Pusat Statistika Provinsi Sumatera Selatan, 2024).

Based on data from the Palembang City Health Office in 2023, five community health centers (Puskesmas) had the highest number of diarrhea cases. Gandus Community Health Center ranked first, followed by Sosial Community Health Center, Makrayu Community Health Center, Talang Betutu Community Health Center, and Alang-Alang Lebar Community Health Center. Of these five community health centers, researchers chose to conduct the study in the Social Community Health Center's work area. In 2021, 1,375 cases of diarrhea were recorded in this area, which then decreased to 723 cases in 2022, but then increased again to 1,976 cases in 2023. This study was conducted at SD Negeri 118 Palembang, one of the schools within the Social Community Health Center's work area (Dinkes Kota Palembang, 2024).

Based on data from the Social Health Center (Puskesmas Sosial), the number of diarrhea cases has fluctuated in recent years. In 2022, there were 976 cases, before declining to 1,895 in 2023, and then again to 1,581 in 2024. Meanwhile, as of May 2025, the number of recorded cases had reached 226. Interviews with diarrhea program officers at the Social Health Center (Puskesmas Sosial) indicated that Sukajaya Village had the highest incidence of diarrhea cases compared to Sukabangun Village. Public Elementary School 118 Palembang, the location of this study, is located in Sukajaya Village, so educational interventions related to diarrhea prevention at the school were deemed highly appropriate and relevant in reducing the incidence of diarrhea in the area. Several factors contributing to diarrhea include limited access to clean water, water contamination by feces, inadequate sanitation facilities, substandard waste disposal, poor personal and environmental hygiene, and unhygienic food storage and serving (Sander, 2005).

These various factors, both directly and indirectly, can increase the risk of diarrhea, including host, environmental, behavioral, and other factors. From the host's perspective, the risk of diarrhea increases due to several conditions, such as not receiving exclusive breastfeeding until the age of two, malnutrition, measles infection, and immune system disorders. Meanwhile, the most influential environmental factors are the availability of clean water and waste disposal systems, as both are significantly affected by human activity. If the environment is unhygienic and there are diarrhea-causing pathogens, coupled with unhealthy community habits, then the spread of diarrhea can occur more easily (Depkes, 2000).

One way to prevent the transmission of viruses, bacteria, and fungi is to wash your hands regularly with soap and running water. If clean water is not available, using hand sanitizer can be an alternative (Wijaya, 2013). This is important because hands can be a vehicle for the transfer of germs, which can spread between individuals and cause various diseases. To prevent this, one step that can be taken is to disinfect your hands with a hand sanitizer spray before consuming food or drinks. This low-viscosity disinfectant can easily be used as a substitute for soap and water when washing your hands. Preventing diarrhea is crucial because it can be fatal, especially in children. Effective prevention can save children's lives and prevent serious complications that can arise from this disease (Pramita, 2013).

According to data from the Basic Education Data, Public Elementary School 118 Palembang has a total of 693 students. Of these, 348 are boys and 345 are girls. Based on grade level, the number of students in grade 1 is 113, grade 2 has 128, grade 3 has 119, and grade 4 has 115. Meanwhile, grade 5 has 118, and grade 6 has 100. In addition, the school has 11 classrooms and a library (Data Pokok Pendidikan, 2025).

School-age children are among the groups most vulnerable to health and nutritional problems, particularly those related to infectious diseases. Epidemiologically, the prevalence of environmentally related diseases, such as diarrheal infections, remains quite high among school children in Indonesia. Diarrhea itself is a sign of infection in the digestive tract, caused by various pathogens, including bacteria, viruses, or parasites. This infectious disease can spread through contaminated food or water, as well as through interactions between individuals due to poor hygiene. Diarrhea can persist for several days and can lead to dehydration due to the loss of fluids and electrolytes, which are crucial for survival (World Health Organization (WHO), 2017).

Infections of the digestive tract and intestines can be caused by many types of bacteria, viruses, and parasites, which commonly result in diarrhea. Infections can spread through contaminated food or drink, or from person to person due to inadequate hygiene, allergies, intestinal absorption problems, and food poisoning (Israeli et al., 2025). This study aims to determine the effect of animated infographic video media on improving the knowledge and attitudes of third-grade students elementary school.

METHODS

This study used a quasi-experimental design with a one-group pretest-posttest approach. This design was chosen because it allows researchers to determine the effect of an intervention by comparing conditions before and after treatment in the same group. In this study, the intervention consisted of diarrhea prevention education using video infographics, followed by measurements of students' knowledge and attitudes before and after the intervention (Soekidjo Notoatmodjo, 2018). The study was conducted at SD Negeri 118 Palembang, an elementary school within the Social Health Center (Puskesmas Sosial) work area. This location was selected based on the high number of diarrhea cases in the area, making it a suitable location for educational intervention. The study period was March to May 2025. Third-grade students were selected as research subjects based on children's cognitive development stage, where children aged 8–9 years are already able to understand visual information well. The population in this study was all 119 third-grade students at SD Negeri 118 Palembang. Sampling was determined using the Slovin formula with a 10% error rate, resulting in a sample size of 54 students. To anticipate the possibility of missing data, an additional 10% was added, resulting in a final sample size of 59 students. The sampling technique used total sampling based on proportional calculations for each study group. The research instrument was a knowledge and attitude questionnaire regarding diarrhea prevention. Before use, the instrument was tested for validity and reliability on 30 students, with results indicating all questions were valid and reliable. The knowledge questionnaire contained multiple-choice questions related to the causes, transmission, and prevention of diarrhea (Notoadmodjo, 2012). The attitude questionnaire consisted of statements with a Likert scale that measured respondents' tendencies toward diarrhea prevention behaviors (Esi Rosita, 2021). Data processing is carried out in three stages, namely editing, coding, and tabulating (Nur & Saihu, 2024) (Supardi, 2014). Data analysis used the Wilcoxon Signed Rank Test because the data were not normally distributed based on the Shapiro-Wilk test results. This test was used to determine differences between pretest and posttest scores for both student knowledge and attitude variables. The significance level used was 95%, with a p-value <0.05, considered statistically significant (Soekidjo Notoatmodjo, 2018). This research has passed ethical testing with No. 0948/KEPK/Adm2/VI/2025

RESULTS

The data used in this study were primary data obtained directly from the participants. The instrument used to collect data was a structured questionnaire designed to measure respondents' knowledge and attitudes regarding diarrhea prevention. These variables were measured at two time points: before the intervention (pretest) and after the intervention (posttest), with the intervention providing health education through video media. The data collection process was carried out by distributing questionnaires during the pretest and posttest phases. This approach allowed researchers to identify and analyze changes in respondents' knowledge and attitudes after receiving the educational intervention. The results obtained from this study are presented as follows:

Table 1. Frequency Distribution of Student Characteristics at Public Elementary School 118 Palembang City in 2025

Variables	Frequency (n)	Percentage (%)
1. Gender		
- Male	26	44,1%
- Female	33	55,9%
2. Age		
- 8 Years	17	28,8%
- 9 Years	34	57,6%
- 10 Years	8	13,6%

Based on Table 1, regarding the characteristics of the students who responded to this study, it is known that the majority of students were in the 9-year-old age range. Of the 59 respondents, 34 students (57.6%) were 9 years old. Meanwhile, 17 students were 8 years old (28.8%), and 8 students were 10 years old (13.6%). Based on the gender distribution, the number of female students in this study was slightly higher than that of male students. Thirty-three respondents (55.9%) were female, while 26 respondents (44.1%) were male.

Table 2. Descriptive Statistics Distribution of Knowledge and Attitudes Regarding Diarrhea Prevention Pre-Test and Post-Test Education in 2025

Variables	Pre-Test			Post-Test		
	Mean	SD	Min	Mean	SD	Min-Max
Knowledge	12,54	1,822	9 – 16	18,14	0,973	16 - 20
Attitude	44,88	3,966	32 – 55	48,61	1,598	43 – 51

Table 2 illustrates the distribution of descriptive statistics regarding respondents' knowledge and attitudes regarding diarrhea prevention before (pre-test) and after (post-test) education in 2025. In the pre-test, the average respondent's knowledge score was 12.54 with a standard deviation of 1.822, indicating significant variation among respondents, with a minimum score of 9 and a maximum of 16. However, after the education (post-test), the average knowledge score increased to 18.14, with a smaller standard deviation of 0.973. This indicates that the educational intervention significantly improved respondents' understanding, with more consistent results across participants.

Meanwhile, in the pre-test, the average respondent attitude score was 44.88 with a standard deviation of 3.966, with a range of scores between 32 and 55. After the intervention (post-test), the average attitude score increased to 48.61, although the increase was smaller than that for knowledge. The standard deviation of attitudes was also smaller (1.598) in the post-test, indicating that respondents' attitudes toward diarrhea prevention became more uniform and positive after education. Overall, both respondents' knowledge and attitudes showed significant improvements after education, with greater improvements seen in knowledge.

Table 3. Test of Normality of Knowledge and Attitude Before And After Providing Diarrhea Prevention Education to Students of Public Elementary School Palembang.

Variables	Mean		p value
	Statistic	df	
PreTest Knowledge	0,125	59	0,022
PostTest Knowledge	0,254	59	0,000
PreTest Attitude	0,161	59	0,001
PostTest Attitude	0,207	59	0,000

Based on Table 3, the results of the Kolmogorov-Smirnov normality test show that the significance value for the pretest knowledge variable is 0.022, posttest knowledge 0.000, pretest attitude 0.001, and the posttest attitude 0.000. All significance values are <0.05, indicating that the data are not normally distributed.

Therefore, the statistical test used in the subsequent analysis is a non-parametric test because the data does not meet the assumption of normality.

Table 4. The Influence of Infographic Video Media on Increasing Students' Knowledge and Attitudes about Diarrhea Prevention at Public Elementary School Palembang in 2025

Variables	Ranks	n	Mean ranks	Sum of rank	Ties	Z	Asympt.Sig (2-tailed)
Knowledge (Pre-Post Test)	Negatif Ranks	0	00,00	0,00	0	- 6,704	0,000
	Positif Ranks	59	30,00	1770,00			
Attitude (Pre-Post Test)	Negatif Ranks	7	26,36	184,50	4	- 5,226	0,000
	Positif Ranks	48	28,24	1355,50			

Table 4 shows the results of the Wilcoxon Signed Rank Test to determine the effect of video infographics on improving students' knowledge and attitudes regarding diarrhea prevention at SD Negeri 118 Palembang in 2025. Based on the knowledge variable, 59 students experienced an increase (Positive Ranking), with an average rank of 30.00. No students experienced a decrease (Negative Ranking) or had the same score before and after the intervention (Ties = 0). The Z-value of -6.704 with a significance value (Asymp. Sig., 2-tailed) of 0.000 (<0.05) indicates a significant difference between students' pre-test and post-test knowledge scores. This means that the use of video infographics significantly improved students' knowledge about diarrhea prevention.

Meanwhile, in the attitude variable, there were 48 students who experienced an increase in attitude (Positive Rating) with an average rating of 28.24, and 7 students who experienced a decrease in attitude (Negative Rating) with an average rating of 26.36. A total of 4 students did not show a change in attitude (Tie). The Z value of -5.226 with a significance of 0.000 also shows a significant difference between attitudes before and after the use of infographic video media. Thus, in addition to increasing knowledge, infographic video media has also proven effective in increasing students' positive attitudes towards diarrhea prevention.

DISCUSSION

The results of the study showed that the average knowledge score of 59 students before receiving education through video infographics was 12.54. After the education, the average score increased to 18.14, indicating a significant increase in knowledge. The Wilcoxon test showed a significant difference in student knowledge before and after the education, with a Z-value of -6.704 and a significance level of 0.000 ($p < 0.05$). This indicates that the education provided was effective in improving students' knowledge about diarrhea prevention. Based on gender, respondents in this study consisted of 26 male students (44.1%) and 33 female students (55.9%). This composition indicates a fairly balanced distribution of respondents. In the context of health education, gender is often associated with differences in how they understand and respond to information. Some literature suggests that female students tend to show a more attentive attitude to material presented, especially through engaging media such as video infographics. However, in this study, gender was not analyzed bivariately because the primary objective was to examine changes in overall knowledge and attitudes. Nevertheless, the relatively even participation of students of both genders strengthens the validity of the finding that animated video media is acceptable and understandable across diverse groups.

Furthermore, in addition to increased knowledge, most student knowledge indicators experienced significant improvements after being educated through video infographics. This education proved effective in strengthening students' understanding, both in clinical aspects such as the initial management of diarrhea and the consequences if left untreated, and in practical aspects related to prevention, such as handwashing, recognizing symptoms of dehydration, and knowing when to seek medical attention (Wulandari, 2023). This improvement demonstrates that delivering information using a visual and interactive approach not only

broadens students' conceptual understanding but also increases their preparedness to apply health knowledge in real-world situations, making it an appropriate strategy to support health promotion efforts in the school environment.

The results of this study indicate a significant increase in students' knowledge after being educated through video infographics regarding diarrhea prevention. This finding aligns with several previous studies demonstrating the influence of visual-based educational media in improving student understanding. Research by (Annis & Qur'aniati, 2023) showed an increase in the average student score from 45.69 before education to 61.25 after. This 15.56-point increase indicates that the educational approach implemented through visual media such as PowerPoint presentations, instructional videos, and hands-on handwashing practice significantly improved student understanding of the material presented.

Furthermore, (Putri & Setiawan, 2023) also demonstrated that animated video media is highly suitable and effective for use as an educational tool in elementary schools, developed through the ADDIE model, and demonstrating optimal results in improving student understanding. Another study by (Shuwaibatul Aqlina et al., 2022) At Madrasah Hasyim Asyari Tulungagung, there was a drastic increase in knowledge from low to high after students were provided with video education on diarrhea prevention. These similar results demonstrate that the use of visual-based educational media, such as animated videos, has characteristics that are suited to the learning styles of elementary school-aged children and has proven effective in conveying health messages in an engaging and easy-to-understand manner. Therefore, animated video media can be a strategic choice in supporting health promotion programs in elementary education environments.

The results showed that 59 students had an average score increase after receiving education. The average student attitude score before receiving education via video infographics was 44.88, indicating that student attitudes toward diarrhea prevention were still varied and not entirely positive. After the education, the average score increased to 48.61, the maximum score on the measurement scale. The Wilcoxon test showed a significant difference in student attitudes before and after the education, as indicated by a Z-value of -5.226 and a significance level of 0.000 ($p < 0.05$). This indicates that the education provided was effective in improving students' attitudes toward diarrhea prevention.

Based on the results of attitude measurements before and after the intervention, a positive increase was observed in almost all respondents' statements regarding diarrhea prevention behavior. Respondents showed increased awareness of the importance of handwashing, maintaining food hygiene, and following teacher recommendations. They also began to realize that bringing lunch from home is safer and the importance of defecating in a clean toilet. Negative attitudes such as being lazy about handwashing or buying snacks indiscriminately tended to decrease after the intervention. This indicates that the information provided can influence and improve students' perspectives on clean and healthy living behaviors. In fact, there are indications that students are motivated to remind those around them and implement clean habits at home. Enjoyable learning, such as through videos, also contributes to positive attitudinal changes.

The results of this study align with previous research, which found that educational media, both print and electronic, are effective in increasing students' knowledge and shaping positive attitudes toward clean and healthy living behaviors (PHBS). The use of video infographics in this study was proven to significantly improve students' attitudes toward diarrhea prevention, as indicated by an increase in average scores and a more uniform and positive shift in attitudes. This aligns with research conducted by (Putu Fani Yustisa, I Ketut Aryana, 2012), which demonstrated that health promotion media can influence students' attitudes toward PHBS.

Furthermore, the theory proposed by (Maulana, 2012) supports these findings, stating that a person's attitude can change if they receive additional information through persuasive approaches or social influences in their environment. Thus, educational media delivered visually and interactively not only broadens students' horizons but also influences the formation of positive attitudes through a learning process that is enjoyable and relevant to their daily lives.

The average scores before and after the education session showed a very significant increase. The knowledge variable saw an average increase of 5.60 points, from a pretest score of 12.54 to 18.14. Meanwhile, the attitude variable saw an average increase of 3.73 points, from 44.88 to 48.61. These data indicate that video infographics are effective in increasing understanding and developing positive attitudes among elementary school students regarding diarrhea prevention.

According to the researchers' assumption, a good knowledge of diarrhea prevention will positively impact students' attitudes and decision-making, particularly regarding maintaining personal and environmental hygiene. Before the education session, students may only have limited knowledge of the information, but as the education progresses, they begin to remember, understand, and absorb the information comprehensively, thus

optimally improving the quality of their knowledge. The improvement in the attitude variable is also closely related to the increase in knowledge. Initially, students receive visual and audio stimuli from the video infographics presented during the education session. This process makes it easier for them to recall previous experiences or information and then connect it to new material, thus forming a more positive attitude towards the importance of clean living behaviors to prevent diarrhea.

Researchers assume that knowledge increases more rapidly than attitudes, because some students already have a prior understanding, such as from teachers or family members. Meanwhile, attitudes require a more complex process of formation, as students tend to answer based on habits and personal experiences. This leads to errors in attitudes before education is conducted. Overall, these findings indicate that knowledge increases more quickly because information is easily grasped visually, while attitude change requires reinforcement through experience and repeated practice. Education using video infographics has a positive effect not only on cognitive aspects but also on the formation of students' attitudes towards disease prevention.

CONCLUSION

Based on the analysis, video infographics proved to be effective and significantly impacted the improvement of students' knowledge and attitudes at Public Elementary School in Palembang. This was evidenced by the significant difference between pretest and posttest scores after the educational intervention. The average knowledge score before education (pretest) was 12.54, and increased to 18.14 after education (posttest). This demonstrates that video infographic media can be used as an influential and engaging educational strategy for elementary school students to support health promotion programs.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

AUTHOR CONTRIBUTIONS

The roles of all authors should be listed: EA: Experiment, Methodology, HD: Writing- Original draft preparation. MM: script writing.

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