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The Effectiveness of Video-Based Media in Improving Understanding of Clean and Healthy Living Behavior for Diarrhea Prevention among Elementary School Students

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ABSTRACT/ ABSTRAK

ABSTRACT*. Diarrhea remains a public health problem among elementary school children and is closely associated with the low implementation of Clean and Healthy Living Behavior (CHLB). Health education is an important effort in diarrhea prevention; however, conventional methods are often less engaging for children. This study aimed to analyze the effectiveness of video-based media in improving students' understanding of CHLB as an effort to prevent diarrhea among students at Kelayan Timur 13 Public Elementary School, Banjarmasin. This study employed a quantitative method using a pre-experimental one-group pre-test–post-test design. The study population consisted of 82 students from grades III to VI, selected using a total sampling technique. Students' understanding of CHLB was measured using a questionnaire that had been tested for validity and reliability before and after the educational intervention delivered through video-based media. Data were analyzed using the Wilcoxon matched-pairs test. The results showed a significant improvement in students' understanding after the educational intervention. Prior to the intervention, students' understanding ranged from poor to good, whereas after the intervention, all respondents (100%) achieved a good level of understanding. Statistical analysis revealed a significant difference between pre-test and post-test scores (p = 0.001). It can be concluded that education on CHLB delivered through video-based media is effective in improving elementary school students' understanding for diarrhea prevention.*

Kata kunci:

Pencegahan diare, Edukasi kesehatan, Anak sekolah dasar, Perilaku cuci tangan, Media video

ABSTRAK. Diare masih menjadi masalah kesehatan masyarakat pada anak usia sekolah dasar dan berkaitan erat dengan rendahnya penerapan Perilaku Hidup Bersih dan Sehat (PHBS). Edukasi kesehatan merupakan upaya penting dalam pencegahan diare, namun metode konvensional sering kali kurang menarik bagi anak. Penelitian ini bertujuan menganalisis efektivitas media video dalam meningkatkan pemahaman PHBS sebagai upaya pencegahan diare pada siswa Sekolah Dasar Negeri Kelayan Timur 13 Banjarmasin. Penelitian ini menggunakan metode kuantitatif dengan desain pre-eksperimental one group pre-test–post-test. Populasi penelitian terdiri dari 82 siswa kelas III sampai VI dengan teknik total sampling. Tingkat pemahaman PHBS diukur menggunakan kuesioner yang telah diuji validitas dan reliabilitasnya sebelum dan sesudah intervensi edukasi melalui media video. Analisis data dilakukan menggunakan uji Wilcoxon matched pairs. Hasil penelitian menunjukkan peningkatan pemahaman siswa yang signifikan setelah diberikan edukasi. Sebelum intervensi, pemahaman siswa berada pada kategori kurang hingga baik, sedangkan setelah edukasi seluruh responden (100%) berada pada kategori baik. Uji statistik menunjukkan perbedaan bermakna antara skor pre-test dan post-test (p = 0,001). Dapat disimpulkan bahwa edukasi PHBS melalui media video efektif meningkatkan pemahaman siswa sekolah dasar dalam pencegahan diare.

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INTRODUCTION

Diarrhea remains a significant public health problem among children, including elementary school students, as it can lead to dehydration, malnutrition, growth disorders, and an increased risk of mortality if not managed appropriately. According to the World Health Organization (2024), diarrhea is the third leading cause of death among children under five years of age, with approximately 443,832 deaths reported annually worldwide. Many cases of diarrhea among older children continue to result in serious health consequences, although most cases are preventable through access to safe drinking water, adequate sanitation, proper handwashing practices, health education, and appropriate management such as oral rehydration therapy and zinc supplementation.

In Indonesia, diarrhea remains a major public health concern, particularly among toddlers. Data from the Indonesian Health Profile 2020 indicate that diarrhea was the second leading cause of death among infants aged 29 days–11 months (9.8%) and children aged 12–59 months (4.5%). Rotavirus is the primary cause of severe diarrhea among toddlers, accounting for 41–58% of hospitalization cases, and recurrent diarrhea may impair growth and contribute to stunting. The 2021 Indonesian Nutritional Status Survey reported a high prevalence of diarrhea among toddlers, reaching 9.8%. To prevent severe diarrhea, the Indonesian government expanded the national rotavirus immunization program in 2022 for infants aged 2–6 months. This effort is supported by the implementation of Clean and Healthy Living Behavior (CHLB) as a preventive strategy recommended by the World Health Organization and the Indonesian Technical Advisory Group on Immunization (ITAGI) to protect millions of children and support the achievement of national health targets and the Sustainable Development Goals (SDGs) 2030 (World Health Organization, 2023).

At the regional level, South Kalimantan Province recorded 68,884 cases of diarrhea, with Banjarmasin City identified as one of the areas with the highest incidence, reporting 10,730 cases. Primary healthcare center data indicate that Kelayan Timur is among the areas with a high incidence of diarrhea, particularly among children aged 7–12 years. These findings underscore that elementary school students represent a vulnerable group requiring targeted and systematic educational interventions.

Field observations reveal that the school environment continues to face sanitation-related challenges, including limited handwashing facilities, poor drainage conditions, and unhealthy snacking habits. The implementation of CHLB practices, such as washing hands before meals and after using the toilet, remains inconsistent. School environments characterized by high levels of social interaction may serve as potential settings for disease transmission if hygiene behaviors are not properly practiced (Fatria et al., 2024; Wulandari & Yuliawati, 2021).

Numerous studies have demonstrated that CHLB education plays an important role in reducing the risk of diarrhea among elementary school children. However, most interventions continue to rely on lectures or printed materials, which are often less engaging for children. Several studies have reported the effectiveness of audiovisual media in improving children's health knowledge (Saputra & Fatrida, 2020; Mansa et al., 2022). Nevertheless, empirical evidence regarding the effectiveness of video-based media in improving understanding of CHLB among urban elementary school students, particularly in Banjarmasin, remains limited. This condition highlights a research gap concerning the impact of video-based media on diarrhea prevention within local urban contexts.

From a theoretical perspective, video-based media are effective learning tools because they enhance children's concentration and focus through engaging and dynamic information delivery. Such media stimulate multiple senses simultaneously, thereby supporting concrete and interactive learning experiences, facilitating the visualization of abstract concepts, and improving vocabulary comprehension, listening skills, and learning motivation (Azizah et al., 2025; Muthmainnah, 2015; Maghfiroh, 2023; Ndraha et al., 2024; Maulana & Rini, 2025). Based on health behavior change theories, such as the Health Belief Model, increased understanding of the benefits and risks associated with specific behaviors plays a critical role in encouraging healthy behavior change (Green & Murphy, 2014; Miyasaka & Kawata, 1976). Video-based media can enhance perceived benefits, clarify health consequences, and strengthen children's motivation to apply CHLB in their daily lives (Situmeang, 2024; Dihardjo et al., 2024).

Elementary school children possess visual and kinesthetic learning characteristics, enabling them to absorb health messages more effectively through animations, illustrations, and direct demonstrations. Therefore, video-based media are considered more effective than conventional lecture-based methods in delivering CHLB messages, particularly related to handwashing practices and personal hygiene (Utomo, 2023; Situmorang, 2023).

Based on the above considerations, this study aimed to examine the effectiveness of video-based media in improving understanding of CHLB for diarrhea prevention among elementary school students. The findings of this study are expected to provide empirical contributions to the development of audiovisual-based health education and to serve as a foundation for schools and health professionals in designing more effective and sustainable promotive interventions.

RESEARCH METHOD

This study employed a quantitative method with a pre-experimental design using a one-group pre-test–post-test approach. Students' level of understanding was measured twice, namely before and after the health education intervention delivered through video-based media. The study population consisted of all students from grades III to VI, totaling 82 participants, at Kelayan Timur 13 Public Elementary School, Banjarmasin. All members of the population were included as the sample using a total sampling technique. The inclusion criteria comprised students who were present during the study, willing to participate in the entire research process, and had obtained consent from their parents or guardians. The exclusion criteria included students who did not participate in one of the measurement stages or failed to complete the questionnaire.

The research instrument was a questionnaire assessing students' understanding of Clean and Healthy Living Behavior (CHLB), consisting of 20 items using a Guttman scale (responses of "Yes" and "No"). The questionnaire covered indicators related to hand hygiene concepts, appropriate times for handwashing, and proper handwashing procedures. Each correct response was scored as 1 and each incorrect response as 0, with total scores converted into percentages and categorized as good (75–100%), moderate (60–74%), and poor (<60%) levels of understanding. Validity testing was conducted on 30 students from another elementary school with similar characteristics, demonstrating that all items were valid (calculated r-value > r-table value of 0.361). Reliability testing yielded a Cronbach's alpha value of 0.868, indicating excellent reliability. The intervention consisted of a single

screening of a 6-minute CHLB educational video, followed by a brief question-and-answer session to ensure students' comprehension of the material.

Data were analyzed using IBM SPSS Statistics version 25. Univariate analysis was performed to describe respondents' characteristics and levels of understanding, while bivariate analysis using the Wilcoxon matched-pairs test was conducted to determine differences in understanding before and after the intervention, with a significance level set at $\alpha = 0.05$. This study received ethical approval from the Research Ethics Committee of Universitas Muhammadiyah Banjarmasin (No. 078/UMB/KE/II/2025) and was supported by official permission from the school and informed consent from parents or guardians. Data confidentiality and respondent anonymity were fully maintained in accordance with the principles of health research ethics.

RESULTS

Univariate Analysis

Table 1. Characteristics of Respondents by Age

No.	Age (years)	Frequency (f)	Percentage (%)
1	8–9	22	26.9
2	10–11	36	43.9
3	>11	24	29.3
	Total	82	100

***Source**: Primary Data, 2025*

Based on Table 1, the majority of respondents were aged 10–11 years, accounting for 36 students (43.9%).

Table 2. Characteristics of Respondents by Sex

No.	Sex	Frequency (f)	Percentage (%)
1	Male	47	57.3
2	Female	35	42.7
	Total	82	100

***Source**: Primary Data, 2025*

As shown in Table 2, most respondents were male, with 47 students (57.3%), while female students accounted for 35 respondents (42.7%).

Table 3. Characteristics of Respondents by Grade Level

No.	Grade Level	Frequency (f)	Percentage (%)
1	Grade III	24	29.3
2	Grade IV	22	26.8
3	Grade V	24	29.3
4	Grade VI	12	14.6
	Total	82	100

***Source**: Primary Data, 2025*

Table 3 indicates that the largest proportions of respondents were from grade III and grade V, each consisting of 24 students (29.3%).

Table 4. Students' Understanding Prior to the Educational Intervention

No.	Level of Understanding	Frequency (f)	Percentage (%)
1	Good	35	42.7
2	Moderate	32	39.0
3	Poor	15	18.3
	Total	82	100

***Source**: Primary Data, 2025*

Based on the analysis presented in Table 4, prior to receiving handwashing education for diarrhea prevention, most respondents demonstrated a good level of understanding, with 35 students (42.7%). Meanwhile, 32 students (39.0%) had a moderate level of understanding, and 15 students (18.3%) had a poor level of understanding.

Table 5. Students' Understanding After the Educational Intervention

No.	Level of Understanding	Frequency (f)	Percentage (%)
1	Good	82	100
2	Moderate	0	0
3	Poor	0	0
	Total	82	100

***Source**: Primary Data, 2025*

As shown in Table 5, after receiving handwashing education for diarrhea prevention, all respondents (100%) demonstrated a good level of understanding.

Bivariate Analysis

Education in Improving Understanding of Clean and Healthy Living Behavior for Diarrhea Prevention through Video-Based Media at Kelayan Timur 13 Public Elementary School, Banjarmasin

Table 6. Bivariate Analysis

Variable	N	Mean	Standard Deviation	Minimum	Maximum
Pre-test	82	2.24	0. 746	1	3
Post-test	82	3.00	0.000	3	3
			p-value = 0.001		

***Source**: Primary Data, 2025*

Normality testing indicated that the data were not normally distributed. Therefore, non-parametric statistical analysis was applied using the Wilcoxon matched-pairs test.

In this study, the mean level of students' understanding before receiving handwashing education for diarrhea prevention was 2.24, with a maximum score of 3 and a minimum score of 1. After the educational intervention, the mean score increased to 3.00, with both the maximum and minimum scores reaching 3.

The results of the Wilcoxon matched-pairs test showed a p-value of 0.001, which was lower than the significance level ($\alpha = 0.05$). This finding indicates that the research hypothesis was accepted, meaning that there was a statistically significant difference in the level of understanding of students at Kelayan Timur 13 Public Elementary School, Banjarmasin, before and after receiving handwashing education for diarrhea prevention.

DISCUSSION

Respondent Characteristics and Their Implications for the Findings

The predominance of respondents aged 10–11 years indicates that most students were at the concrete operational stage, in which logical thinking skills begin to develop but remain highly dependent on direct experiences and visual support. At this stage, children are able to understand simple cause–effect relationships; however, they are not yet optimal in processing abstract information without visual assistance (Piaget, as cited in Muthmainnah, 2015). Therefore, delivering CHLB messages through video-based media that incorporate concrete illustrations, animations, and direct demonstrations is highly relevant. This finding is consistent with Aqlina et al. (2022), who reported that video-based education significantly improved understanding of diarrhea prevention among elementary school students by simplifying health concepts into forms that are easily comprehensible for children.

In addition to age, sex characteristics should also be considered when interpreting the study findings. The majority of respondents in this study were male students. Several studies have shown that boys tend to exhibit higher levels of attention toward learning media that are visually dynamic, colorful, and rich in motion (Adnan et al., 2024). Video-based media, particularly in the form of animation, effectively meet these characteristics and thereby enhance students' engagement during the learning process. Nevertheless, Annis and Qur'aniati (2023) reported that improvements in students' understanding of CHLB through video-based media did not differ significantly between male and female students. This suggests that despite differences in learning preferences, the effectiveness of video-based media remains inclusive across sexes.

The distribution of grade levels, dominated by Grade III and Grade V students, also contributed to the success of the intervention. Grade III students already possess basic literacy skills that enable them to understand simple narratives and visual symbols, while Grade V students have more mature cognitive capacities to integrate new information with prior learning experiences. This finding aligns with Muslimin et al. (2023), who reported that students in upper and middle elementary grades demonstrated more significant improvements in understanding CHLB following video-based education. Thus, the respondent characteristics in this study created favorable conditions for optimizing the effectiveness of video-based media as a health education tool.

Mechanisms of the Effectiveness of Video-Based Media in Improving Understanding of CHLB

The significant improvement in students' understanding following the educational intervention can be explained through Dual Coding Theory, which posits that information presented simultaneously through visual and verbal channels is processed in two distinct cognitive systems, thereby enhancing retention and understanding (Listiyani et al., 2025). CHLB video-based media combine moving images, narrated audio, and simple text, allowing students to construct stronger mental representations compared to verbal instruction alone. This process enables students not only to understand the information but also to remember practical steps, such as proper handwashing techniques.

Furthermore, the effectiveness of video-based media can also be explained through the concept of multisensory stimulation. Audiovisual media stimulate both visual and

auditory senses simultaneously, thereby increasing students' focus, attention, and engagement in the learning process (Maghfiroh, 2023; Ndraha et al., 2024). In the context of CHLB education, multisensory stimulation allows students to directly observe examples of healthy behaviors, imitate the demonstrated movements, and understand the consequences of unhealthy behaviors. This process is particularly important in health education, which emphasizes behavioral change rather than merely increasing knowledge.

From the perspective of Cognitive Load Theory, systematically designed video-based media can help reduce students' cognitive load by presenting information in a gradual and structured manner (Sweller, as cited in Azizah et al., 2025). Concise, illustrative content that aligns with children's daily life contexts enables students to process information without experiencing cognitive overload. This finding reinforces the results reported by Nugraha et al. (2024) and Sumi (2022), who stated that animated videos effectively improve understanding of CHLB by facilitating the integration of new information into students' existing knowledge structures.

The Role of the School Environment and External Factors

The success of CHLB education through video-based media cannot be separated from the support of external factors, particularly the role of teachers and the school environment. Teachers function as facilitators who reinforce health messages, direct students' attention, and create a conducive learning atmosphere. A supportive classroom environment enhances the effectiveness of video-based media in delivering educational messages. According to Green and Murphy (2014), within the framework of the Health Belief Model, increased understanding of health benefits and risks must be supported by an environment that enables behavioral change.

In addition to the role of teachers, the physical and social conditions of the school environment also influence the internalization of CHLB messages. Schools with adequate sanitation facilities, such as access to handwashing stations and clean water, reinforce the messages delivered through video-based media. Conversely, limited facilities may hinder the implementation of healthy behaviors even when students' understanding has improved. This finding is consistent with Dihardjo et al. (2024), who emphasized that health behavior change in children requires consistent environmental support.

Students' motivation also plays an important role in the effectiveness of the intervention. Video-based media that are engaging and relevant to students' daily lives can enhance intrinsic motivation to learn and apply CHLB. Situmeang (2024) stated that audiovisual media can increase perceived benefits and strengthen children's intentions to perform healthy behaviors. Thus, the interaction between learning media, teacher support, and the school environment becomes a key factor in the success of CHLB education.

Differences in Understanding Before and After the Educational Intervention

The significant difference in students' understanding before and after the educational intervention indicates that video-based media functioned as an effective learning stimulus in improving understanding of CHLB. This improvement not only reflects an increase in the amount of information received by students but also demonstrates deeper cognitive processing in understanding the meaning and purpose of clean and healthy living behaviors. This finding aligns with Rahayuni and Rusminingsih (2021), who reported that groups

receiving video-based interventions showed greater improvements in understanding compared to control groups.

The effectiveness of video-based media is also related to the process of visual repetition, which allows students to access the same information repeatedly in a consistent format. According to Muzni et al. (2023), repetition of material through visual media helps strengthen long-term memory and facilitates information recall when needed. In the context of this study, video presentations that displayed handwashing steps sequentially provided students with opportunities to understand and internalize these behaviors more deeply.

Moreover, video-based media offer a pleasant and non-monotonous learning experience, thereby reducing boredom and increasing student engagement. This finding is consistent with Indang et al. (2023), who stated that health education delivered through video-based media can increase students' active participation and promote more sustainable behavior change. Therefore, the significant difference in understanding before and after the educational intervention can be understood as the result of a combination of the strengths of video-based media, student characteristics, and supportive learning environments.

CONCLUSION

This study concludes that education on Clean and Healthy Living Behavior (CHLB) delivered through video-based media significantly improves elementary school students' understanding in efforts to prevent diarrhea. This improvement is demonstrated by a statistically significant difference in the level of understanding before and after the educational intervention, in which all respondents achieved a good level of understanding following the intervention. Inferentially, these findings confirm that video-based media represent an effective health education approach for conveying CHLB messages, particularly handwashing practices as a preventive measure against diarrhea.

The effectiveness of video-based media in this study can be attributed to the simultaneous presentation of visual and auditory information, which facilitates students' ability to understand, retain, and internalize health messages. Considering the cognitive characteristics of elementary school students, who tend to be visual and kinesthetic learners, video-based media have proven to be appropriate as both promotive and preventive strategies within the school setting. Therefore, the utilization of video-based media is recommended as an integral component of school-based health education programs to support diarrhea prevention efforts from an early age.

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