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Effect of Video Education on Dengue Knowledge in Adolescents

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ABSTRACT

Dengue hemorrhagic fever remains a significant public health problem, particularly in endemic areas where adolescents are also at risk of exposure. Limited knowledge regarding transmission, symptoms, and prevention may contribute to inadequate preventive behavior. Educational media that are attractive and easy to understand are needed to improve adolescent knowledge, including video-based health education. This study aimed to determine the effect of video media on improving adolescents' knowledge about dengue hemorrhagic fever. This quasi-experimental study used a one-group pretest-posttest design. The participants were 100 students in grades VII-IX at MTs Darussalam, Melong, Cimahi, recruited through total sampling. A five-minute dengue education video was shown three times during the intervention session. Knowledge was assessed immediately before and after the intervention using an 11-item study-specific questionnaire. Data were summarized descriptively and analyzed using the Marginal Homogeneity test. Before the intervention, most respondents had poor knowledge (64.0%), while only 15.0% had good knowledge. After the intervention, the proportion with good knowledge increased to 54.0%, while poor knowledge decreased to 17.0%. The Marginal Homogeneity test indicated a statistically significant change in knowledge level ($p < 0.001$). Video-based health education was associated with a significant improvement in adolescents' dengue knowledge. This medium may be considered as an accessible health-promotion strategy for school-age populations.

Keywords: adolescents, dengue hemorrhagic fever, health knowledge, video education

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INTRODUCTION

Dengue is a mosquito-borne viral infection that is prevalent in tropical and subtropical regions. It is transmitted mainly by Aedes aegypti and Aedes albopictus mosquitoes. Transmission is influenced by climate, rainfall, urban density, population mobility, environmental conditions, and community practices, making prevention dependent on both vector control and public participation (World Health Organization [WHO], 2025).

In 2024, WHO recorded more than 14.3 million dengue cases and more than 10,500 deaths across 112 countries, representing the highest annual global burden reported to date. Clinical manifestations range from asymptomatic infection and mild febrile illness to severe dengue characterized by plasma leakage, bleeding, organ impairment, and death (WHO, 2025).

Indonesia reported 114,720 dengue cases and 894 deaths in 2023. By epidemiological week 43 of 2024, 210,644 cases and 1,239 deaths had been reported in 259 districts and cities across 32 provinces, confirming the continuing national burden of dengue (Kementerian Kesehatan Republik Indonesia, 2024).

The local situation also supports the relevance of school-based prevention. Official data from Cimahi indicated that dengue cases increased from 363 cases with 2 deaths in 2023 to 822 cases with 6 deaths in 2024. This substantial increase demonstrates the need for accessible preventive education in communities and schools, including the Melong area where this study was conducted (Dinas Kesehatan Kota Cimahi, 2025).

Dengue prevention in Indonesia emphasizes environmental management, mosquito-breeding-site elimination, personal protection, and sustained community participation. These measures require residents to recognize transmission risks and perform preventive actions consistently; therefore, improving public knowledge remains an important component of dengue control (Kementerian Kesehatan Republik Indonesia, 2024).

Knowledge is a fundamental cognitive determinant of preventive action. Adequate knowledge enables individuals to identify risk factors, recognize warning signs, and select appropriate measures to reduce mosquito breeding and exposure. Conversely, insufficient knowledge may limit the consistent adoption of dengue-prevention practices (Notoatmodjo, 2021).

Adolescents are a strategic target for school-based health promotion because their capacity for logical and abstract thinking continues to develop, and they can communicate health messages to peers and family members. Their familiarity with digital and visual media also makes audiovisual education particularly suitable for this population (Marinda, 2020).

Health education aims to strengthen knowledge, skills, and attitudes so that individuals can make informed health decisions. Within nursing practice, this educational role is consistent with Pender's Health Promotion Model, which emphasizes cognitive and affective factors that support health-promoting behavior (Notoatmodjo, 2021; Pender et al., 2015).

Video is a practical educational medium because it simultaneously engages visual and auditory channels, presents information dynamically, and can be replayed to reinforce key messages. These characteristics may improve attention, comprehension, and information retention, particularly among learners who are accustomed to digital media (Notoatmodjo, 2014).

Previous studies have reported improvements in dengue-related knowledge following audiovisual or video-based education among school-age populations (Suryaningtyas, 2019; Anisa et al., 2024; Gasong & Septianingsih, 2022). Hermida et al. (2021) also demonstrated that participatory dengue education improved knowledge among children and parents. However, evidence from adolescents in high-burden local school settings remains limited.

Based on the continuing dengue burden, the importance of adolescent knowledge, and the potential advantages of audiovisual learning, this study aimed to analyze changes in adolescents' dengue knowledge after video-based health education at MTs Darussalam, Kelurahan Melong.

METHODS

This quasi-experimental study used a one-group pretest-posttest design. It was conducted from January to June 2025 at MTs Darussalam, Kelurahan Melong, within the working area of Puskesmas Melong Tengah, Cimahi.

The population consisted of students in grades VII to IX at MTs Darussalam. Total sampling was used, and all eligible students were invited to participate, resulting in a sample of 100 adolescents. The inclusion criteria were willingness to participate and the absence of special educational needs based on information from the class teacher. Students who withdrew, returned incomplete questionnaires, or did not complete the intervention were excluded.

The independent variable was video-based health education, and the outcome was dengue knowledge. The intervention consisted of a five-minute educational video shown three times during a single session. Knowledge was measured immediately before and after the intervention using an 11-item study-specific questionnaire developed from the study objectives and dengue education content. Correct answers received 1 point and incorrect answers received 0 points. Total scores were categorized as poor (<56%), fair (56%-75%), or good (76%-100%) (Nursalam, 2020).

Before data collection, the questionnaire underwent item-validity and reliability testing. Eleven items met the validity criteria, and Cronbach's alpha was 0.973, indicating excellent internal consistency.

Univariate analysis was used to summarize the frequency distribution of knowledge levels before and after the intervention. The Marginal Homogeneity test was used to evaluate changes in paired categorical knowledge data, with statistical significance set at $p < 0.05$. Ethical approval was granted by the Research Ethics Committee of STIKes Budi Luhur Cimahi (No. 154/D/KEPK-STIKes/VI/2025).

RESULTS

The study involved 100 adolescent respondents from MTs Darussalam. The results are presented in frequency distribution tables for knowledge before and after the intervention, followed by the inferential analysis.

Table 1. Knowledge Level Before Video-Based Health Education

Knowledge level	Frequency	Percent
Poor	64	64.0
Fair	21	21.0
Good	15	15.0
Total	100	100.0

Before the intervention, most respondents had poor knowledge about dengue hemorrhagic fever.

Table 2. Knowledge Level After Video-Based Health Education

Knowledge level	Frequency	Percent
Poor	17	17.0
Fair	29	29.0
Good	54	54.0
Total	100	100.0

After the intervention, the proportion of respondents with good knowledge increased substantially, while the proportion with poor knowledge declined.

Table 3. Effect of Video-Based Health Education on Knowledge

Variable	p-value	Interpretation
Pretest–posttest knowledge level	<0.001	Significant

The Marginal Homogeneity test showed $p < 0.001$, indicating a statistically significant change in adolescents' knowledge levels after video-based health education. The pretest distribution was dominated by poor knowledge (64.0%), whereas the posttest distribution was dominated by good knowledge (54.0%).

DISCUSSION

The findings showed a substantial improvement in dengue knowledge after the video-based intervention. Before the intervention, nearly two-thirds of respondents were in the poor-knowledge category; afterward, more than half were in the good-knowledge category. The statistically significant shift suggests that the educational session was associated with better understanding of dengue transmission, symptoms, and prevention.

This improvement can be explained by the cognitive process of acquiring knowledge through sensory input. Video simultaneously provides visual and auditory information, allowing key messages to be presented through images, narration, and repetition. This combination can facilitate attention, comprehension, and recall more effectively than verbal explanation alone (Notoatmodjo, 2014, 2021).

The suitability of the medium for the target population may also have contributed to the findings. Adolescents are familiar with digital and visual content and have an increasing capacity to process logical and abstract information. A concise video can therefore present dengue concepts in a concrete and engaging format that is compatible with their developmental and learning characteristics (Marinda, 2020).

The present findings are consistent with Suryaningtyas (2019), who reported improved dengue-prevention knowledge after health education, and with Anisa et al. (2024), who found that animated video education increased knowledge of dengue prevention. Together, these studies support the use of audiovisual media for delivering concise preventive messages to students.

Similar results were reported by Gasong and Septianingsih (2022), who observed improvements in students' knowledge and attitudes after mosquito-breeding-site eradication education. Hermida et al. (2021) also found that a learning-by-teaching approach improved dengue knowledge among children and parents. These findings indicate that interactive and visually supported educational strategies can strengthen dengue literacy across school and family settings.

From a nursing perspective, the findings are consistent with Pender's Health Promotion Model. The model proposes that health-promoting behavior is influenced by prior experiences, perceived benefits, perceived barriers, self-efficacy, and interpersonal influences. Video education can strengthen the cognitive foundation required for adolescents to recognize the benefits of dengue prevention and consider preventive actions in daily life (Pender et al., 2015).

School-based video education is also practical because the same standardized content can be delivered to many students and repeated when reinforcement is required. Collaboration among nurses, teachers, and community health centers could help integrate dengue education into school health activities and maintain message accuracy.

Nevertheless, improved knowledge should not be interpreted as evidence of improved preventive behavior. Knowledge is an important prerequisite, but behavior is also affected by motivation, family support, environmental conditions, access to resources, and opportunities to participate in mosquito-control activities. Subsequent interventions should therefore combine education with practical activities such as larval monitoring and environmental clean-up.

The local epidemiological context strengthens the public-health relevance of the intervention. Cimahi experienced a marked increase in reported dengue cases in 2024, indicating that preventive education remains important in communities and schools (Dinas Kesehatan Kota Cimahi, 2025). Adolescents may also extend the reach of health messages by discussing them with peers and family members.

The principal limitation of this study was the one-group pretest-posttest design without a control group. Consequently, the observed change cannot be attributed exclusively to the video intervention because testing effects, information from teachers or families, exposure to social media, or other external factors may have contributed to the posttest results.

In addition, the study measured knowledge immediately after the intervention and did not assess long-term retention, attitudes, or preventive practices. Although the questionnaire demonstrated excellent internal consistency, further reporting of content development and external validation would strengthen the evidence for its measurement properties.

Overall, the findings suggest that video-based health education is a feasible school-based approach for improving short-term dengue knowledge among adolescents. Stronger evidence will require controlled designs, longer follow-up, validated instruments, and behavioral outcomes.

CONCLUSION

The findings indicate a statistically significant shift in adolescents' dengue knowledge after video-based health education at MTs Darussalam, Kelurahan Melong. Poor knowledge decreased from 64.0% to 17.0%, while good knowledge increased from 15.0% to 54.0% ($p < 0.001$). These results suggest that the intervention was associated with improved short-term understanding of dengue transmission, symptoms, and prevention.

Video is relevant for adolescent health education because it combines visual and auditory information in an accessible format. However, because this study did not include a control group or long-term follow-up, the findings should not be interpreted as definitive evidence of causal effectiveness or sustained behavioral change.

RECOMMENDATION

Schools and health-service providers may consider integrating video-based dengue education into routine school health-promotion activities, particularly in high-burden areas. Delivery should involve collaboration among teachers, nurses, and community health centers, and should be accompanied by practical mosquito-control activities to support the translation of knowledge into preventive action.

Future studies should use a comparison or control group, assess long-term knowledge retention, and examine attitudes and preventive practices. Researchers should also provide detailed information on questionnaire development and conduct broader psychometric validation to strengthen methodological transparency.

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