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Article Title

# The Effect of Video-Based Health Education on Improving Students' Knowledge of Helminthiasis Prevention

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**ABSTRACT**

*Infections caused by Soil-Transmitted Helminths (STH) remain a major public health issue in Indonesia, particularly among primary school students. This high prevalence is closely associated with poor personal hygiene practices driven by a lack of knowledge about prevention (a predisposing factor). This study aimed to analyze the effect of video-based health education on improving students' knowledge regarding helminthiasis prevention at SDN 101 Salu Simbuang, Luwu Regency. A quantitative pre-experimental approach with a one-group pretest-posttest design was utilized. A total of 30 students were selected through stratified sampling to serve as respondents. Primary data were collected using a structured questionnaire to measure knowledge before (pretest) and after (posttest) the intervention. Data were analyzed using the Wilcoxon Signed-Rank Test ($\alpha = 0.05$). The results revealed a substantial increase in the students' mean knowledge score from 5.00 (SD = 0.788) at baseline to 7.63 (SD = 0.615) post-intervention. The statistical analysis confirmed that this improvement was highly significant ($p < 0.001$). Item analysis identified significant improvements across most prevention concepts, although understanding of specific handwashing procedural details showed no improvement (remaining at 50.00% incorrect). In conclusion, video-based health education significantly and effectively improves primary school students' knowledge (predisposing factors) of helminthiasis prevention, making it a highly recommended health promotion tool in school settings.*

*Keywords:* *Health Promotion; Helminthiasis; Knowledge; Video Media.*

## INTRODUCTION

Infections caused by Soil-Transmitted Helminths (STH) remain a major public health challenge in various tropical and subtropical countries, including Indonesia. The prevalence of STH infections in Indonesia shows a concerning rate, with an estimated average reaching 28% across various districts and cities. This high-rate places primary school children among the most vulnerable groups to infection (Ekayanti et al., 2022; Arinda & Buana, 2023). Indonesia's tropical climate and high humidity provide an ideal environment for the life cycles of parasitic worms, such as Ascaris lumbricoides, Trichuris trichiura, and hookworms, thereby facilitating transmission of infection in children's play environments (Elmiyanti et al., 2022; Angria & Ka'bah, 2023).

The impact of helminthiasis on primary school children is multifaceted and highly detrimental. Chronic infection with parasitic worms directly disrupts intestinal nutrient absorption, leading to the loss of essential nutrients such as carbohydrates and proteins (Fauzi et al., 2023). This condition has serious implications for children's nutritional status, triggering anemia and malnutrition, and in the long term, contributing to a national priority health issue, namely stunting (Nofita et al., 2022; Ruslin et al., 2023). Furthermore, these negative impacts extend to cognitive aspects, where infected children frequently experience decreased learning concentration, lethargy, and an overall decline in academic productivity (Agustin et al., 2023).

The high transmission of helminthiasis is closely linked to behavioral and sanitation factors. Poor personal hygiene practices are the primary determinants of

this infection's transmission (Arisanti et al., 2023). Various studies have identified risk behaviors that remain prevalent among primary school students, such as the habit of not washing hands with soap before eating or after contact with soil (Hakim et al., 2023), poor nail hygiene (Rafika et al., 2020), and the habit of playing in contaminated environments without footwear (Arinda & Buana, 2023). These behaviors create a continuous cycle of fecal-oral transmission in school and home environments.

Based on health behavior theoretical frameworks, such as the model proposed by Green and Kreuter (2005), behavior change (e.g., personal hygiene practices) must be preceded by predisposing factors, the primary of which is knowledge. The existing gap is that many students practice risk behaviors due to an inadequate understanding of the dangers, modes of transmission, and prevention methods of helminthiasis (Ekayanti et al., 2022). Descriptive studies across various locations indicate that students' knowledge of STH infections often falls in the poor or fair categories (Arinda & Buana, 2023), underscoring the urgency of educational interventions as the foundation for behavior change.

Addressing this knowledge gap, health promotion interventions through education have proven to be an effective strategy. Various studies in Indonesia have confirmed that health education can significantly improve students' knowledge (Angria & Ka'bah, 2023; Manyullei et al., 2023). However, the primary gap lies in the methods and media used to deliver this education. Several previous studies have examined the effectiveness of traditional media such as posters (Syafrawati & Ramadani, 2022), lectures (Elmiyanti et al., 2022), and brochures (Agustin et al., 2023).

The novelty of this study lies in the focused use of audiovisual media, specifically video, as the primary educational instrument. In the digital era, video media offers advantages for attracting attention, visualizing the abstract life cycle of helminths, and demonstrating preventive practices (such as handwashing) more dynamically than static media (Noviyanti et al., 2021). Other studies have also combined video with other media, such as games (Lestari et al., 2023); however, the effectiveness of video as a focused, standalone intervention remains unclear.

This study was conducted at SDN 101 Salu Simbuang, Luwu Regency, where initial observations revealed poor personal hygiene practices among students, including infrequent handwashing before eating and limited awareness of environmental hygiene. There is no published data on the effectiveness of video-based health education interventions specifically in this study location. Therefore, this study provides a scientific contribution by examining whether video media is an effective and relevant tool for improving students' knowledge of helminthiasis prevention in this region.

Based on the background and gaps described, the objective of this study is to determine the effect of video-based health education on students' knowledge levels at SDN 101 Salu Simbuang, Luwu Regency, regarding helminthiasis prevention. This study is expected to provide empirical evidence regarding the effectiveness of video media as a health promotion instrument in primary school settings. Furthermore, the findings are anticipated to serve as input and recommendations for schools, policymakers, and Primary Health Center (Puskesmas) in designing and implementing helminthiasis prevention intervention programs that are more effective, engaging, and tailored to students' characteristics.

## METHOD

This study adopted a quantitative approach using a pre-experimental design (Notoatmodjo, 2018). Specifically, a one-group pretest-posttest design was utilized. This design was selected for its relevance to the primary research objective, which was to evaluate the significant effect of the health education intervention on students' knowledge. This measurement was conducted by comparing the respondents' knowledge scores before the intervention (pretest) with their knowledge scores after the intervention (posttest).

Data collection was conducted between March and April 2024. The study setting was SDN 101 Salu Simbuang, Luwu Regency. The population comprised all actively enrolled students at the school, totaling 146 students. From this population, the study sample was selected using stratified sampling, with specific criteria established to meet the desired quota. The final sample size in this study was 30 students, of whom 14 were male and 16 were female.

The primary data source for this study was data collected directly from the respondents. The research instrument utilized was a validated and reliable structured questionnaire designed to measure the students' knowledge of helminthiasis prevention. The primary data collection process was conducted through three systematic stages (Sugiyono, 2019). First, the initial stage (pretest), where the questionnaire was administered to 30 respondents to assess their baseline knowledge level. Second, the intervention stage, during which all respondents received health education on helminthiasis prevention delivered via audiovisual media (video). Third, the final stage (posttest), in which an identical questionnaire was readministered to respondents to measure changes or improvements in knowledge following the intervention.

The collected data were processed and analyzed using statistical software through two stages (Dahlan, 2020). The first stage was an univariate analysis, used to describe the respondents' demographic characteristics (such as age and gender)

and to present the dependent variables (pretest and posttest knowledge scores) using frequency distributions and mean values. The second stage was bivariate analysis, aimed at testing the hypothesis and addressing the research objective. As per the statistical protocol, the data were initially tested for normality using the Shapiro-Wilk test. The results indicated that the data were not normally distributed; therefore, the nonparametric Wilcoxon Signed-Rank Test was used to assess the significance of the difference between the pretest and posttest scores. The confidence level was set at 95%, with a significance level (α) of 0.05. The educational intervention was considered to have a statistically significant effect if the obtained p-value was ≤ 0.05.

## RESULTS

The results of this study were derived from primary data collected from 30 respondents at SDN 101 Salu Simbuang, Luwu Regency. The data are presented through two stages of analysis: univariate analysis to describe the respondents' characteristics and the knowledge variable, and bivariate analysis to test the research hypothesis.

**Table 1. Frequency Distribution of Respondents' Characteristics**

| Characteristic | Frequency (n) | Percentage (%) |
|---|---|---|
| Gender | | |
| Boy | 14 | 46.67 |
| Girl | 16 | 53.33 |
| Age | | |
| 8 | 13 | 43.33 |
| 9 | 7 | 23.33 |
| 10 | 10 | 33.33 |

*Source: Primary Data, 2024.*

Of the 30 respondents in the study, the majority were female (n = 16, 53.33%), while male respondents accounted for 14 (46.67%). Regarding age, the largest group consisted of 8-year-olds (n = 13, 43.33%), followed by 10-year-olds (n = 10, 33.33%) and 9-year-olds (n = 7, 23.33%) (Table 1).

**Table 2. Comparison of Mean Knowledge Scores Before (Pretest) and After (Posttest) the Intervention**

| Variable | Mean | Standard Deviation | N |
|---|---|---|---|
| Baseline Knowledge Levels (Pre-test) | 5.00 | 0.788 | 30 |
| Knowledge After Levels (Post-test) | 7.63 | 0.615 | 30 |

*Source: Primary Data, 2024.*

There was a clear increase in the students' mean knowledge score following the educational intervention. The students' baseline mean knowledge score (pretest) was 5.00 (SD = 0.788). After the video-based intervention, the mean knowledge score (posttest) increased substantially to 7.63 (SD = 0.615) (Table 2).

**Table 3. Description of Respondents' Knowledge Based on Questionnaire Items Before (Pretest) and After (Posttest) Education**

| No | Item Question Knowledge About Worm Pre-Test Post-Test | Pre Test | | Post Test | |
|---|---|---|---|---|---|
| | | False (%) | True (%) | False (%) | True (%) |
| 1 | What are worms? | 23.30 | 76.70 | 0.00 | 100.00 |
| 2 | Who is most often affected by worms? | 43.30 | 56.70 | 40.00 | 60.00 |
| 3 | What are the signs and symptoms of worms? | 53.30 | 46.70 | 26.70 | 73.30 |
| 4 | What are some ways to treat or prevent worms? | 50.00 | 50.00 | 10.00 | 90.00 |
| 5 | When should we wear footwear? | 53.30 | 46.70 | 23.30 | 76.70 |
| 6 | How often should we take deworming medication? | 63.30 | 36.70 | 33.30 | 66.70 |
| 7 | How many types of worms can spread through soil? | 53.30 | 46.70 | 13.30 | 86.70 |
| 8 | What worms are transmitted through soil? | 46.70 | 53.30 | 26.70 | 73.30 |
| 9 | How many steps are needed to wash your hands with soap effectively? | 53.30 | 46.70 | 10.30 | 89.70 |
| 10 | What is the first step in handwashing? | 60.00 | 40.00 | 50.00 | 50.00 |

*Source: Primary Data, 2024.*

Table 3 details the respondents' baseline knowledge level for each item before the intervention. The lowest knowledge was identified in item 6 ("How often should we take deworming medication?"), where 63.30% of respondents answered incorrectly. Furthermore, item 10 ("What is the first step in handwashing?") also showed poor understanding, with 60.00% answering incorrectly. Understanding of signs and symptoms (item 3), footwear use (item 5), types of helminths (item 7), and handwashing steps (item 9) remained low, with over half of respondents (53.30%) answering these baseline items incorrectly.

Furthermore, there was a substantial improvement in understanding across almost all items following the intervention. Understanding of "ways to treat or prevent" (item 4) increased sharply to 90.00% correct. Similarly, understanding of "handwashing steps" (item 9) and "types of helminths" (item 7) improved to 89.70% and 86.70% correct, respectively. The item with the lowest pre-intervention understanding (item 6) also showed improvement, with incorrect answers decreasing from 63.30% to 33.30%. Nevertheless, item 10 remained the lowest-scoring item post-intervention (50.00% incorrect), indicating minimal improvement for this specific indicator (Table 3).

**Table 4. Wilcoxon Signed-Rank Test Results for the Significance of Knowledge Before and After the Intervention**

| Variable | N | Mean Rank | Sig. (2-tailed)/p-value |
|---|---|---|---|
| Knowledge (Post-test - Pre-test) | 30 | 15.50 | 0.001 |

*Source: Primary Data, 2024.*

The bivariate analysis results in Table 4 reveal a significance value (*p-value*) of < .001. This value is substantially lower than the established significance threshold ($p < 0.05$). Consequently, at a 95% confidence level, the alternative hypothesis (Ha) is accepted, and the null hypothesis ($H_0$) is rejected. This indicates a statistically significant difference in knowledge between the pre- and post-intervention periods. These findings demonstrate that video-based health education on helminthiasis prevention significantly improves students' knowledge at SDN 101 Salu Simbuang, Luwu Regency.

## DISCUSSION

This study aimed to analyze the effect of video-based health education on improving students' knowledge regarding helminthiasis prevention at SDN 101 Salu Simbuang. The primary quantitative findings indicate that the administered intervention had a statistically significant effect. The bivariate analysis using the Wilcoxon Signed-Rank Test (Table 4) yielded a p-value of < .001, which is substantially below the $\alpha = 0.05$ significance threshold. This result definitively addresses the research objective, demonstrating a highly significant difference in students' knowledge before (pretest) and after (posttest) receiving the education. This improvement is descriptively confirmed (Table 2), where the students' mean knowledge score increased substantially from 5.00 (SD = 0.788) to 7.63 (SD = 0.615). These findings indicate that video-based education is an effective intervention for enhancing students' understanding of helminthiasis prevention.

From the perspective of the health behavior theory proposed by Green and Kreuter (2005), this intervention can be analyzed as an effort to modify predisposing factors. This theory posits that behavior change (in this context, personal hygiene practices and clean, healthy living behaviors to prevent helminthiasis) is preceded by changes in an individual's internal domain, with knowledge as the fundamental component. The results of this study (a mean increase from 5.00 to 7.63) prove that the intervention successfully and significantly strengthened these predisposing factors. This knowledge enhancement is an essential initial step before a child can adopt recommended preventive behaviors, as emphasized by Arisanti et al. (2023) and Hakim et al. (2023).

The observed knowledge improvement in this study aligns with similar intervention studies in Indonesia that used a pretest-posttest design. A study by Lestari et al. (2023) that used game and video media also reported a drastic increase in mean knowledge scores from 12.30 to 44.23. Similarly, Syafrawati and Ramadani (2022), who examined poster media, found an increase in the mean score from 71 to 84. A study by Manyullei et al. (2023), which also employed the Wilcoxon test ($p = .001$), found a mean increase from 3.81 to 4.47 following health counseling. These findings, coupled with the results of the current study, reinforce the empirical evidence that educational interventions, regardless of media variations, are highly effective strategies for improving students' cognitive domains.

Further quantitative analysis at the item level (Table 3) revealed a concerning baseline (pretest) knowledge state among the students. Prior to the intervention, the majority of respondents provided incorrect answers to crucial items, such as "How often should we take deworming medication?" (63.30% incorrect) and "What is the first step in handwashing?" (60.00% incorrect). Poor understanding regarding signs and symptoms (53.30% incorrect) and handwashing steps (53.30% incorrect) was also identified. This baseline knowledge gap confirms the findings of previous descriptive cross-sectional studies, such as those reported by Ekayanti et al. (2022) and Arinda and Buana (2023), which found that without active intervention, students' knowledge of STH infections is often inadequate.

Specifically, the novelty of this study lies in the use of video media as a standalone educational instrument. The quantitative findings (a mean score increase of 2.63 points) support the hypothesis that audiovisual media hold strong appeal for primary school students. This success is consistent with the argument by Noviyanti et al. (2021), who highlighted the effectiveness of image-based media and short films in delivering health messages in Papua. Video media possesses advantages over static media like posters (Syafrawati & Ramadani, 2022) or brochures (Agustin et al., 2023), as it can visualize abstract concepts (such as the parasite's life cycle) and demonstrate procedures (such as handwashing steps) more dynamically and engagingly, thereby facilitating better comprehension among students.

Following the intervention (Table 3), significant improvements occurred across almost all knowledge items. Students' understanding of "ways to treat or prevent" helminthiasis surged drastically, with 90.00% of respondents answering correctly. Similarly, items that previously had low comprehension, such as "handwashing steps" (item 9), experienced a sharp increase, with 89.70% of respondents understanding it. Significant improvements were also observed in understanding the "types of helminths" (86.70% correct) and "frequency of taking deworming medication" (66.70% correct). This drastic improvement in the personal hygiene knowledge domain is critical, as it

provides the cognitive foundation for the behavioral practices emphasized by Rafika et al. (2020) on nail hygiene and by Elmiyanti et al. (2022) on handwashing practices.

Nevertheless, the quantitative item analysis also uncovered specific weaknesses of the utilized video media. For item 10 ("What is the first step in handwashing?"), The posttest results (Table 3) showed minimal improvement; the percentage of incorrect answers remained high at 50.00%. This is a crucial quantitative finding. It indicates that although the video intervention successfully helped students understand the conceptual importance of the handwashing steps (Item 9: 89.70% correct), it failed to convey the specific procedural details of the initial step (Item 10: 50.00% incorrect). This failure highlights the need to revise the audiovisual materials to better emphasize the correct procedural sequence.

The intervention's success in improving students' knowledge (predisposing factors) is a critical achievement in broader prevention efforts. Enhancing knowledge on helminthiasis prevention directly contributes to mitigating more severe and interconnected public health issues. As emphasized by Fauzi et al. (2023), helminthiasis prevention is crucial to averting nutrient absorption disorders. Furthermore, these findings have strategic relevance to national priority programs, as chronic helminth infections are a major risk factor contributing to childhood malnutrition and stunting (Nofita et al., 2022; Ruslin et al., 2023). Therefore, helminthiasis prevention education is a vital upstream intervention to support optimal child growth and development.

Overall, this study quantitatively proves that video-based education has a significant effect ($p < .001$) on improving knowledge of helminthiasis prevention. The 4-point increase in the mean score confirms the effectiveness of this intervention in strengthening students' predisposing factors. These results are consistent with previous studies examining various educational media (Syafrawati & Ramadani, 2022; Agustin et al., 2023; Lestari et al., 2023; Manyullei et al., 2023).

However, these findings must be reviewed comprehensively within the theoretical framework established by Green and Kreuter (2005). This study has demonstrated success in modifying predisposing factors (knowledge). However, this knowledge improvement does not automatically guarantee sustained behavior change (clean and healthy living practices). Long-term success relies heavily on two other factors not examined in this study: enabling factors and reinforcing factors. Enabling factors include the availability of physical infrastructure within the school environment, such as adequate access to clean water, soap, and hygienic latrine conditions (Elmiyanti et al., 2022; Arinda & Buana, 2023). Meanwhile, reinforcing factors include sustained social support from teachers, peers, and, particularly, parents, who continuously remind and model personal hygiene practices at home and school (Arisanti et al., 2023; Hakim et al., 2023).

Therefore, a limitation of this study is its singular focus on the knowledge variable. The increase in score from 5.00 to 7.63 is a significant cognitive achievement, but it must be followed up on. Future studies are recommended to shift from merely measuring knowledge to directly evaluating practice. Subsequent research should adopt a more comprehensive design that not only intervenes in knowledge but also assesses and ensures the availability of enabling factors (facilities) and reinforcing factors (social support) at the study site (Nofita et al., 2022; Angria & Ka'bah, 2023).

## CONCLUSIONS AND SUGGESTIONS

Based on the quantitative data analysis and discussion of the study conducted on 30 students at SDN 101 Salu Simbuang, a conclusion addressing the research objective can be drawn. This study concretely demonstrates that the video-based health education intervention on helminthiasis prevention has a statistically significant effect ($p < .001$) on improving students' knowledge. This finding is supported by a substantial increase in respondents' mean knowledge score, which rose from 5.00 at the pretest to 7.63 at the posttest. This knowledge enhancement (a predisposing factor) is a fundamental achievement in prevention efforts. Nevertheless, an in-depth analysis of the posttest results also identified a specific weakness in the intervention, where the understanding of procedural details (the first step of handwashing) showed no improvement (remaining at 50.00% incorrect). While this cognitive knowledge improvement is an essential initial step, it does not guarantee sustained hygienic behavior change without the support of enabling factors (facilities) and reinforcing factors (social support).

Based on these conclusions, several recommendations with practical and academic implications are formulated. As a practical policy implication, schools and health policymakers, particularly local Primary Health Centers, should adopt audiovisual (video) media as a standard tool within the School Health Unit (*UKS*) program, given its high effectiveness in capturing students' attention and improving comprehension. However, as a tangible follow-up to the study's findings, the video materials used must be revised to more accurately emphasize the procedural details of handwashing. Furthermore, they should ideally be combined with hands-on practical demonstrations to enhance psychomotor skills. For future researchers, it is recommended to shift the focus from merely measuring the knowledge variable. Future studies should adopt more comprehensive designs, such as a quasi-experimental design with a control group, that not only measure knowledge improvement but also evaluate the availability of enabling factors (access to clean water and soap) and reinforcing factors (teacher and parental support), ultimately assessing their objective impact on students' personal hygiene practices.

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