

Effectiveness of audio-visual and poster media in improving handwashing knowledge among adolescents

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ABSTRACT

Introduction: Handwashing with soap (HWWS) is a key indicator of clean and healthy living behavior and plays a crucial role in preventing infectious diseases among adolescents. Schools are strategic settings for health promotion, and educational media such as audiovisual materials and posters are widely used to improve students' knowledge and hygiene practices. This study aimed to determine the effectiveness of health education using audiovisual media and posters in increasing adolescents' knowledge of HWWS.

Methods: This quasi-experimental study employed a one-group pretest–posttest design involving 37 eighth-grade students at SMPN 5 Kendari. Participants received health education delivered through audiovisual media and posters. Knowledge was assessed using pretest and posttest questionnaires. Data were analyzed using univariate and bivariate methods, including the Wilcoxon Signed Rank Test due to non-normal data distribution.

Results: The findings showed an increase in the mean knowledge score from 56.89 to 63.78 after exposure to audiovisual media, and from 57.43 to 74.46 after exposure to poster media. The Wilcoxon test indicated significant differences between pretest and posttest scores for both press ($p = 0.000$), confirming the effectiveness of both approaches. Poster media demonstrated a greater improvement in students' HWWS knowledge compared to audiovisual media.

Conclusion: Health education using both audiovisual and poster media effectively increased adolescents' HWWS knowledge, with poster media showing superior impact. These results highlight the importance of utilizing a variety of educational tools in school-based hygiene promotion. Schools are encouraged to integrate both media regularly in health education activities and collaborate with local health centers to promote continuous HWWS. Future studies should explore more advanced audiovisual content and evaluate long-term behavioral changes among students.

Keywords: Audio-visual media; Handwashing with soap; Health education; Posters; Adolescents.



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INTRODUCTION

Handwashing with soap (HWWS) is recognized globally as one of the most effective, simple, and low-cost public health measures to prevent infectious diseases ([Appiah-Brempong and Appiah-Brempong, 2024](#)). It plays a crucial role in reducing the transmission of pathogens responsible for diarrhea, respiratory infections, and other communicable illnesses that frequently affect children and adolescents ([Apraku *et al.*, 2024](#)). In Indonesia, HWWS has been established as a key component of the Clean and Healthy Living Behavior (Perilaku Hidup Bersih dan Sehat/PHBS) program, embedded within the larger national health movement known as GERMAS (Gerakan Masyarakat Hidup Sehat). This initiative emphasizes preventive and promotive health behaviors to empower communities in improving their quality of life through simple yet impactful daily practices, including proper handwashing. Despite extensive government efforts, compliance with proper HWWS practices among school-aged populations remains suboptimal, as many children and adolescents lack awareness or do not consistently apply correct handwashing techniques ([Bick *et al.*, 2025](#)).

Schools have a strategic role in shaping health behaviors, as they serve not only as educational environments but also as platforms for instilling lifelong habits. The school health program (UKS/M) aims to promote healthy and clean living behaviors through structured health education, environmental hygiene improvements, and preventive health services ([Devkota *et al.*, 2020](#)). By integrating HWWS education into routine school activities, students can be encouraged to adopt healthy practices and act as agents of change within their families and communities. National health data indicate that diarrheal diseases continue to be a significant public health issue in Indonesia. Millions of cases are reported annually, with the highest burden among young children and adolescents. Diarrhea is commonly caused by pathogens such as Rotavirus, *Escherichia coli*, *Shigella* spp., and intestinal parasites, which often spread due to inadequate hygiene and poor handwashing habits. The Indonesian Basic Health Survey (RISKESDAS) consistently highlights the need to increase handwashing practices, with the national prevalence of proper HWWS rising gradually but still far below the expected target set by public health authorities ([Dwipayanti, Lubis and Harjana, 2021](#)).

The importance of HWWS has been further emphasized globally through initiatives such as Global Handwashing Day, observed every October 15th. In Indonesia, however, surveys from Sulawesi Tenggara Province show that only around half of the population consistently perform proper handwashing, and the rates vary considerably between districts. These data demonstrate the need for more effective educational approaches to successfully promote HWWS among adolescents, a group that is particularly vulnerable to infectious diseases and is highly influenced by school-based health promotion strategies ([Gupta and Anand, 2021](#)).

Health promotion activities in schools increasingly incorporate multimedia tools, including audio-visual content and printed materials such as posters ([Jefferson *et al.*, 2023](#)). These media support learning by simplifying complex concepts, attracting students' attention, and facilitating message retention. Audio-visual media, such as videos, combine motion, sound, and images to create dynamic learning experiences that help students better understand and remember health behaviors ([Kalam *et al.*, 2021](#)). Meanwhile, posters serve as constant visual reminders placed in strategic locations, enabling repeated exposure to key messages even outside formal learning sessions. Both media types have been widely used in health education programs and have demonstrated effectiveness in improving knowledge, attitudes, and behavioral intentions ([Luetke Lanfer and Reifegerste, 2021](#)).

Previous studies strengthen the evidence for using these media in school-based interventions. Research conducted in elementary and secondary schools across Indonesia reports significant improvements in knowledge and behavioral practices after students are exposed to videos, animations, PowerPoint materials, or posters related to handwashing (MacLeod *et al.*, 2023). For example, students who received HWWS education using video presentations showed measurable gains in knowledge and motivation to practice proper handwashing techniques. Other studies indicate that posters, due to their visual clarity and accessibility, are sometimes even more effective in supporting the continual reinforcement of health messages (Mensah *et al.*, 2022).

Despite these findings, comparative studies focusing specifically on adolescents remain limited. Adolescence is a critical developmental stage characterized by increased independence, heightened social interaction, and susceptibility to peer influence. Therefore, understanding whether audio-visual media or posters serve as more effective tools in this age group can provide valuable evidence for schools and public health policymakers in designing targeted health promotion strategies. Based on this rationale, the present study aims to examine the effectiveness of health education using audio-visual media and posters in improving knowledge about Handwashing with Soap (HWWS) among adolescents at SMPN 5 Kota Kendari. By comparing pretest and posttest knowledge scores, this study aims to determine which medium has the greater impact and how each contributes to enhancing students' awareness and understanding of proper handwashing practices. The findings are expected to support the development of more effective school-based health education programs and contribute to broader public health efforts aimed at reducing communicable diseases among young populations.

RESEARCH METHODOLOGY

This study employed a quantitative approach using a quasi-experimental design with a one-group pretest–posttest format. The design involved measuring the same group of participants before and after the intervention to determine the effectiveness of health education using audiovisual media and posters. The study was conducted at SMPN 5 Kendari from July to September 2025. A total of 37 eighth-grade students were selected as the study population and were exposed to health education sessions focused on proper handwashing with soap (CTPS). The intervention consisted of structured educational sessions that utilized audiovisual materials and posters, followed by a post-test evaluation.

Data were collected through direct observation and structured questionnaires administered during the pretest and posttest sessions. The questionnaire assessed students' knowledge of CTPS and served as the primary data collection instrument. Supporting tools included educational materials, attendance sheets, and documentation sheets. Data analysis followed two main procedures: univariate analysis to describe frequency distributions, minimum and maximum values, and mean scores; and bivariate analysis to test differences in knowledge before and after the intervention. A normality test (Shapiro–Wilk and Kolmogorov–Smirnov) was first conducted to determine the distribution of the data. Since the results indicated a non-normal distribution ($p < 0.05$), the Wilcoxon Signed-Rank Test was used as the primary statistical method. All analyses were performed using the Statistical Package for the Social Sciences (SPSS) version 25.0.

RESULT

This study assessed the effectiveness of audio-visual media and poster media in improving adolescents' knowledge of handwashing with soap (CTPS). Data analysis included descriptive statistics to examine score distributions before and after the intervention, followed by the Wilcoxon Signed Rank Test to evaluate significant differences between pretest and posttest

scores. The findings demonstrate notable improvements in knowledge across both intervention methods, with poster media showing a higher level of effectiveness.

Table 1. Distribution of knowledge scores before and after health education using audio-visual and poster media (n = 37)

Media Type	Measurement	n	Minimum	Maximum	Mean Score
Audio-Visual	Pretest	37	40	70	56.89
	Posttest	37	55	70	63.78
Poster	Pretest	37	40	70	57.43
	Posttest	37	65	80	74.46

Table 1 shows that both audio-visual and poster media contributed to an increase in students' knowledge regarding handwashing with soap (CTPS). In the audio-visual group, the mean score increased from 56.89 during the pretest to 63.78 in the posttest, indicating a moderate improvement in knowledge. Meanwhile, the poster group demonstrated a substantially greater increase, with the mean score rising from 57.43 to 74.46 after the intervention. These findings suggest that although both methods were effective in enhancing students' understanding of CTPS, poster media resulted in a higher level of knowledge improvement compared to audio-visual media.

Table 2. Wilcoxon signed rank test for knowledge improvement using audio-visual and poster media

Media Type	Comparison	Negative Ranks (n)	Positive Ranks (n)	Mean Rank	p-value
Audio-Visual	Pretest–Posttest	1	26	14.37	0.000
	Pretest–Posttest	0	37	19.00	0.000

Table 2 indicates that both audio-visual and poster media produced significant improvements in students' knowledge of handwashing with soap (CTPS). In the audio-visual group, 26 students showed an increase in posttest scores with a mean rank of 14.37, while only one student experienced a decrease. The p-value of 0.000 confirms that this improvement is statistically significant. In the poster group, all 37 students demonstrated increased posttest scores, with a higher mean rank of 19.00. The p-value of 0.000 similarly indicates a significant difference between pretest and posttest scores. These results show that although both media were effective, poster media produced a greater overall improvement in knowledge compared to audio-visual media. Overall, the findings demonstrate that both audio-visual and poster media are effective in improving adolescents' understanding of handwashing with soap (CTPS). However, poster media produced a greater increase in knowledge scores and showed stronger statistical significance in the Wilcoxon analysis. These results indicate that poster-based health education is more impactful than audio-visual media in enhancing students' understanding of proper handwashing practices.

DISCUSSION

This study aimed to evaluate the effectiveness of audio-visual and poster media in improving adolescents' knowledge of handwashing with soap (CTPS) at SMPN 5 Kendari. The findings indicate that both media significantly enhanced students' knowledge, as demonstrated by the Wilcoxon Signed Rank Test, which showed p-values of 0.000 for both groups. These results confirm that structured health education, utilizing engaging media, can have a meaningful influence on students' understanding of hygiene behaviors. Notably, poster media yielded a

higher overall improvement compared to audio-visual media, suggesting that students absorb and retain information differently depending on the delivery method.

The improvement in the audio-visual group aligns with the idea that audiovisual materials are potent tools in health education. Audio-visual media combine sound, movement, and visual cues, which can increase learners' attention and enhance comprehension (Perangin-angin and Sembiring, 2025). As stated in educational theory, multisensory learning stimulates better cognitive processing, allowing students to internalize concepts more effectively. Who reported significant gains in knowledge following audio-visual health education on handwashing behavior. Audiovisual methods contributed to improvements in students' attitudes and practices regarding CTPS. The combination of sound and moving images may create a more engaging learning environment, especially for adolescents who are accustomed to digital media (Rahmadani, Lumintang and Chabibah, 2025).

Despite its effectiveness, the audio-visual method in this study produced a smaller gain compared to the poster method. This discrepancy may be attributed to several factors. First, audio-visual information is often presented rapidly, which can limit students' opportunities to process and review key messages. Second, the effectiveness of audio-visual materials depends heavily on the quality of the video, clarity of narration, and relevance of visuals. If the content is too fast-paced or too complex, students might miss essential details (Sari and Novitasari, 2024).

Additionally, technological challenges such as equipment limitations, sound clarity, or distractions during the session may influence the outcome. In contrast, poster media demonstrated a greater impact on knowledge improvement. Poster-based education offers a static and accessible format, allowing students to view and reflect on the key messages presented consistently. The combination of concise text, attractive colors, and illustrations helps students grasp essential concepts more easily (Vande Velde, Overgaard and Bastien, 2021). Posters also serve as environmental cues, reinforcing learning even after the formal session ends. Poster-based health education significantly improved knowledge among elementary school students. Posters effectively enhanced students' knowledge, attitudes, and behaviors related to CTPS. Posters may appeal particularly to visual learners who benefit from repeated exposure to simplified messages (Rombeallo and Nasri, 2025).

The nature of the CTPS topic may also explain the greater effectiveness of poster media in this study. Handwashing is a procedural, step-by-step activity, and posters are well-suited to visually depicting the required actions. Clear images of handwashing steps, soap application, and rinsing techniques may have helped students visualize proper behavior more effectively than video demonstrations that might pass too quickly (Tuang, 2021). Additionally, posters can be displayed in classrooms or hallways, providing continuous reinforcement long after the health education session ends. The findings from both methods underscore the importance of interactive and visually appealing health education strategies in promoting hygiene behaviors. According to behavioral science theory, knowledge is the foundation for shaping attitudes and developing healthy habits. When adolescents are equipped with accurate information and motivated through attractive educational media, they are more likely to adopt and maintain proper CTPS practices. This is particularly important in school settings, where students are at higher risk of infectious diseases due to crowding and frequent contact with shared surfaces (Sharma *et al.*, 2023).

Furthermore, the results of this study have important implications for public health and educational policymaking. Schools can integrate both media forms into routine health education activities to improve hygiene awareness. The use of posters may be especially beneficial in resource-limited settings, as they are inexpensive, require no special equipment, and provide long-

term visibility (Thorseth *et al.*, 2021). Meanwhile, audio-visual media can complement posters by offering dynamic explanations and demonstrating behaviors in real-time. Combining both methods may create a more comprehensive approach, catering to different learning styles and reinforcing key messages from multiple angles. This study also contributes to the growing evidence that school-based health education plays a crucial role in shaping student behavior. Adolescents are at a formative stage where their health habits can significantly influence their long-term well-being. Encouraging proper handwashing practices can help reduce the incidence of infectious diseases such as diarrhea, which remains a significant public health concern in Indonesia. By strengthening hygiene education in schools, policymakers can support broader initiatives, such as GERMAS and PHBS, to cultivate healthier communities (Suprpto, Mulat, 2022)

The findings highlight the value of integrating both audio-visual and poster media in health education to enhance adolescents' knowledge of CTPS. Although poster media showed a higher impact, both methods remain practical tools for promoting hygiene awareness. Future research could explore the combination of these media, assess long-term behavioral changes, or evaluate effectiveness across different age groups and settings.

CONCLUSION

The findings of this study demonstrate that both audio-visual and poster media are effective in increasing adolescents' knowledge of handwashing with soap (CTPS). Significant improvements were observed in both intervention groups, with poster media showing a greater overall impact compared to audio-visual media. These results underscore the importance of utilizing engaging and visually supportive educational tools to enhance students' understanding of proper hygiene practices. Based on these findings, it is recommended that schools integrate both poster and audio-visual media into regular health education activities. Poster media can be displayed continuously to reinforce learning, while audio-visual materials can be used periodically to provide dynamic demonstrations. Collaboration between schools and local health centers is also encouraged to ensure ongoing hygiene education programs. Future studies are recommended to evaluate long-term behavioral changes and explore the use of more innovative and interactive learning media.

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Conflict of Interest

There are no potential conflicts of interest relevant to this article.

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