International Journal of Advanced Health Science and Technology
Multidisciplinary: Rapid Review: Open Access Journal e-ISSN:2808-6422; p-ISSN:2829-3037

RESEARCH ARTICLE OPEN ACCESS
Manuscript received April 25, 2025; revised May 08, 2025; accepted May 10, 2025; date of publication June 01, 2025
Digital Object Identifier (DOI): https://doi.org/10.35882/ijahst.v3i3.460

How to cite: Maulidya Aisyah Kusuma Dewi, Indriatie, Sari Luthfiyah, and Joko Suwito, "Effectiveness of Audiovisual and Roleplay Methods in Enhancing Hand Washing Knowledge and Skills in School-Age Children", International Journal of Advanced Health Science and Technology, vol. 3, no. 3, pp. 140-148, June 2025

Effectiveness of Audiovisual and Roleplay Methods in Enhancing Hand Washing Knowledge and Skills in School-Age Children

Maulidya Aisyah Kusuma Dewi, Indriatie, Sari Luthfiyah, and Joko Suwito

Department of Nursing, Polytechnic of the Ministry of Health Surabaya, Indonesia

Corresponding author: Maulidya Aisyah Kusuma Dewi (e-mail: maulidyaakusumad@gmail.com).

ABSTRACT Hand washing with soap is essential in preventing infections among school-aged children. Engaging educational methods such as audiovisual media and roleplay can improve children's knowledge and skills in proper hand hygiene. This study aimed to compare the effectiveness of audiovisual and roleplay-based education on hand washing knowledge and skills. A quasi-experimental design with a two-group pre-test post-test was conducted on 48 students at MINU Lumpur Gresik, selected by simple random sampling. Results showed significant improvement in both groups after the intervention ($p < 0.05$). Audiovisual education improved knowledge, while roleplay enhanced practical skills. No significant difference was found between the two methods overall. Both methods are effective in promoting hand washing behavior among children. These findings are important for school health programs and public health efforts. Audiovisual and roleplay methods can help nurses and teachers improve children's handwashing knowledge and skills, support early hygiene habits, and prevent infectious diseases.

INDEX TERMS Health education; Audiovisual media; Roleplay; Hand washing with soap; School-age children

I. INTRODUCTION

School-age children have complex health problems. One of the personal hygiene behaviors that is lacking is the habit of Washing Hands with Soap (CTPS). Hands that are not washed with soap are at risk of contamination with germs, which can be transmitted through touch. These germs are at risk of causing diarrhea in children because of the habit of not washing hands with soap before and after eating, after coming from the bathroom, and after touching surrounding animals [1].

Improper handwashing is still found in school-age children. This is due to a lack of information about CTPS in children which can cause various health problems. Health problems in school-age children due to not washing their hands are, Upper Respiratory Tract Infection (ISPA), worms and diarrhea [2]. According to the data UNICEF In 2019, the incidence of pneumonia was 36%, congenital diseases 13%, and diarrhea 10% were the main causes of death in early childhood in Indonesia. Therefore, the CTPS movement is important to carry out because it can reduce the incidence of diarrhea by 31% and reduce ISPA disease by 21% [4].

Based on World Health Organization data (WHO) About 19% of children in the world wash their hands with soap regularly [6]. Based on data from the Central Statistics Agency (BPS) In 2023, the prevalence of handwashing behavior using soap in Indonesia is 51.1% with a total of 683,052 people who have been counted. The prevalence of CTPS incorrect in East Java Province was 58.4% of the 105,129 people who had been counted. Meanwhile, the prevalence of handwashing behavior with soap in Gresik City is 61.8% [7].

Hand hygiene primarily aims to reduce microbial load, particularly bacteria, while mechanically eliminating dust and debris from the skin's surface. Furthermore, regular handwashing plays a crucial role in removing numerous viruses responsible for infectious diseases, especially those affecting the respiratory and gastrointestinal systems, such as influenza and diarrhea [8].

Health education about washing hands with soap must start from an early age. According to the results of previous research by James Criony, audiovisual media is influential in developing changes in knowledge in school-age children. Audiovisual media provides optimal results in increasing target knowledge about the 6 steps of good and correct hand washing [9]. Using audiovisual media has several advantages, including being considered more efficient in helping elementary school students' understanding, making it easier in the learning process related to steps, and can be done repeatedly [10].

According to research conducted by Suista et al, the roleplay method is widely used because this process is fun and is directed at solving problems related to human relationships, especially those related to the lives of school-age children [11].

The study conducted by Solehudin demonstrated that both audiovisual and roleplay methods are effective in improving handwashing behavior among school-age children. These methods provide students with opportunities to develop proper handwashing skills using soap. The audiovisual method allows students to learn through engaging visual and auditory media, while the roleplay method offers direct learning experiences through real-life scenario simulations, thereby enhancing their understanding and practical handwashing skills [12].

Due to the limited implementation of health education using audiovisual and roleplay methods in Indonesia, this study is important to evaluate the effectiveness of both methods in improving handwashing knowledge and skills among school-age children.

Based on preliminary observations and a review of previous studies, further investigation is deemed necessary to enhance the knowledge and skills related to proper handwashing (CTPS) among school-age children. Therefore, this study aims to examine the effectiveness of educational interventions using audiovisual media and roleplay in improving the knowledge and handwashing skills of school-age children at MINU Lumpur Gresik.

II. METHOD

This research employed a quasi-experimental design utilizing a two-group pre-test and post-test framework to evaluate the effectiveness of health education interventions delivered through audiovisual and roleplay methods in enhancing handwashing knowledge and skills among school-aged children. The audiovisual media used in this study was a 10-minute animated video containing materials on the definition of handwashing with soap, appropriate times to wash hands, diseases that can be prevented through hand washing, and the proper steps of handwashing based on guidelines. Meanwhile, the roleplay method involved a scenario illustrating early disease prevention through handwashing with soap in everyday situations.

The research was conducted at MINU Lumpur Gresik, involving 48 fourth-grade students who were selected through simple random sampling. The participants were then divided equally into two groups: the audiovisual group and the roleplay group.

Data collection was conducted in three main stages. The first stage was preparation, which included developing research instruments, validating the knowledge questionnaire, preparing observation checklists, and obtaining ethical approval and research permissions. The second stage was implementation, where both groups were given a pre-test, followed by the educational intervention, and finally a post-test. The audiovisual group received a health education session through an animated video explaining the six steps of proper hand washing, while the roleplay group participated in an interactive demonstration where students practiced hand washing in guided simulation scenarios. The third stage involved data processing and statistical analysis.

The knowledge data were collected using a validated questionnaire consisting of 15 true/false items. Each correct answer was given a score of 1, and incorrect answers were scored 0. The results were categorized into three levels: Good (≥76–100%), Enough (56–75%), and Not Good (<56%). Hand washing skills were measured using an observation checklist based on the six-step standard hand washing procedure issued by the Indonesian Ministry of Health. Observers scored each step with 1 (performed correctly) or 0 (not performed), and the final score was categorized using the same criteria as knowledge.

Data were analyzed using the Wilcoxon signed-rank test to assess within-group differences in knowledge and skills before and after the intervention. To compare the post-test outcomes between the two intervention groups and determine the more effective method, the Mann-Whitney U test was employed. A significant level of $p < 0.05$ was established for all statistical analyses.

III. RESULTS

This chapter presents the findings of the study entitled 'The Effectiveness of Education Using Audiovisual and Roleplay Methods on Handwashing Knowledge and Skills among School-Age Children at MINU Lumpur Gresik.' The research was conducted at MINU Lumpur Gresik from January 10 to January 13, 2025. The study involved 48 fourth-grade school-age children as respondents.

Based on **TABLE 1**, the characteristics of fourth-grade school-age children at MINU Lumpur Gresik show that the majority were 10 years old (67%), while a smaller proportion were 9 years old (23%), 11 years old (8%), and 12 years old (2%). Regarding gender, most of the students were female (52%), and nearly half were male (48%). In terms of experience, all fourth-grade students at MINU Lumpur Gresik. (100%) had never received health education related to Hand Washing with Soap (HWWS).

TABLE 1
Characteristics of Respondents

Characteristics	Frequency (f)	Percentage (%)
Age		
9 years	11	23%
10 years	32	67%
11 years	4	8%
12 years	1	2%
Gender		
Male	23	48%
Female	25	52%
Experience of Following Education About HWWS		
Yes	0	100%
Yes	48	0%
Total	48	100%

Based on TABLE 2, prior to receiving health education using the audiovisual method, most fourth-grade school-age children at MINU Lumpur Gresik (71%) were in the not good category of hand washing knowledge, while (29%) were categorized as enough. However, following the intervention, all students (100%) achieved the good category in hand washing knowledge.

TABLE 2
Knowledge Level of School-Age Children About Hand Washing Before and After Receiving Health Education Using the Audiovisual Method at MINU Lumpur Gresik on January 10–13, 2025

Knowledge	Before		After	
	f	%	f	%
Good	0	0%	24	100%
Enough	7	29%	0	0%
Not Good	17	71%	0	0%
Total	24	100%	24	100%

TABLE 3
Knowledge Level of School-Age Children About Hand Washing Before and After Health Education Using the Roleplay Method at MINU Lumpur Gresik on January 10–13, 2025

Knowledge	Before		After	
	f	%	f	%
Good	0	0%	24	100%
Enough	6	25%	0	0%
Not Good	18	75%	0	0%
Total	24	100%	24	100%

Based on TABLE 3, prior to receiving health education using the roleplay method, most fourth-grade school-age children at MINU Lumpur Gresik (75%) were categorized as not having good knowledge about hand washing, while (25%) were in the Enough category. After roleplay-based health education was provided, all students (100%) achieved the good category in hand washing knowledge.

TABLE 4
Skill Level of School-Age Children in Hand Washing Before and After Receiving Health Education Using the Audiovisual Method at MINU Lumpur Gresik on January 10–13, 2025

Skill	Before		After	
	f	%	f	%
Good	0	0%	18	75%
Enough	0	0%	6	25%
Not Good	24	100%	0	0%
Total	24	100%	24	100%

Based on TABLE 4, the data show that before receiving health education using the audiovisual method, all fourth-grade school-age children at MINU Lumpur Gresik (100%) had not good hand washing skills. After the intervention, the majority (75%) demonstrated good skills, while a smaller portion (25%) showed enough skills.

TABLE 5
Skill Level of School-Age Children in Hand Washing Before and After Receiving Health Education Using the Audiovisual Method at MINU Lumpur Gresik on January 10–13, 2025

Skill	Before		After	
	f	%	f	%
Good	0	0%	22	92%
Enough	0	0%	2	8%
Not Good	24	100%	0	0%
Total	24	100%	24	100%

Based on TABLE 5, the data show that before receiving health education using the roleplay method, all fourth-grade school-age children at MINU Lumpur Gresik (100%) did not have good handwashing skills. After the intervention, nearly all students (92%) demonstrated good skills, while a small portion (8%) showed enough skills.

TABLE 6
Differences in Knowledge Levels of School-Age Children About Hand Washing Using Audiovisual and Roleplay Methods at MINU Lumpur Gresik on January 10–13, 2025 Based on the Wilcoxon Signed Rank Test

Knowledge	Audiovisual Method				*Roleplay* Method			
	Before		After		Before		After	
	F	%	F	%	F	%	F	%
Good	0	0	24	100	0	0	24	100
Enough	7	29	0	0	6	25	0	0
Not Good	17	71	0	0	18	75	0	0
Sig	.000				.000			

Based on TABLE 6, the data show that there was a significant difference in the knowledge levels of fourth-grade school-age children at MINU Lumpur Gresik before and after receiving health education using the audiovisual method, with a significant value of 0.000 based on the Wilcoxon Signed

Rank Test. Similarly, a significant difference was also found in the knowledge levels before and after health education using the roleplay method, with a significant value of 0.000.

TABLE 7
Differences in Hand Washing Skill Levels of School-Age Children Using Audiovisual and Roleplay Methods at MINU Lumpur Gresik on January 10–13, 2025 Based on the Wilcoxon Signed Rank Test

Skill	Audiovisual Method				*Roleplay* Method			
	Before		After		Before		After	
	F	%	F	%	F	%	F	%
Good	0	0	18	75	0	0	22	92
Enough	0	0	6	25	0	0	2	8
Not Good	24	100	0	0	24	100	0	0
Sig	.000				.000			

Based on **TABLE 7**, the data show that there was a significant difference in the hand washing skill levels of fourth-grade school-age children at MINU Lumpur Gresik before and after receiving health education using the audiovisual method, with
a significant value of 0.000 based on the Wilcoxon Signed Rank Test. Likewise, a significant difference was also observed in the skill levels before and after health education using the roleplay method, with a significant value of 0.000.

TABLE 8
Mann-Whitney Test Results on Knowledge of Fourth-Grade School-Age Children at MINU Lumpur Gresik on January 10–13, 2025

Mann-Whitney			
Method	**N**	**Mean Rank**	**Sig**
Audiovisual	24	26,42	,318
Roleplay	24	22,58	

Based on **TABLE 8**, the Mann-Whitney test results showed a significant value of 0.318 (>0.05), indicating that there was no significant difference between the two groups after the intervention. Therefore, both educational media can be used as effective tools for health education to improve the knowledge of fourth-grade school-age children at MINU Lumpur Gresik regarding handwashing.

TABLE 9
Mann-Whitney Test Results on Handwashing Skills of Fourth-Grade School-Age Children at MINU Lumpur Gresik on January 10–13, 2025

Mann-Whitney			
Method	**N**	**Mean Rank**	**Sig**
Audiovisual	24	22,19	,172
Roleplay	24	26,81	

Based on **Table 9**, the Mann-Whitney test results showed a significant value of 0.172 (>0.05), indicating that there was no significant difference between the two groups after the intervention. Thus, both educational media can be utilized as effective methods for health education to enhance the handwashing skills of fourth-grade school-age children at MINU Lumpur Gresik.

IV. DISCUSSION

A. KNOWLEDGE OF SCHOOL-AGE CHILDREN ABOUT HAND WASHING BEFORE AND AFTER HEALTH EDUCATION USING THE AUDIOVISUAL METHOD AT MINU LUMPUR GRESIK

Based on the results of the research, the level of knowledge of grade 4 school-age children at MINU Lumpur Gresik before and after being given health education about hand washing using audiovisual methods has increased. The results of the calculation show that before health education was carried out using the audiovisual method, most school-age children (71%) had not good knowledge and almost half (29%) had enough knowledge. Meanwhile, after health education is carried out using the audiovisual method, all school-age children have good knowledge (100%).

Knowledge is the sum of what is obtained from the process of knowing about an object, which can be a thing or event experienced by the subject [13]. Factors that affect knowledge are age, gender, experience, and sources of information [14]. This is in line with the theory put forward by Notoatmodjo that factors that affect the level of knowledge are age, gender, and sources of information [15].

According to Jean Piaget's Theory of Cognitive Development, children aged 10 and 11 are in a concrete operational stage, where children have a visual learning style by understanding and remembering information through images, videos, or other visual forms [16]. In line with research by Khawa et al That the ages of 10 and 11 years are effective ages to increase knowledge about personal hygiene. At this age, children are already able to remember information through pictures, videos, and visuals [17].

According to Piaget, school-age children are at the concrete operational stage, and girls in this phase are usually quicker to understand the symbols and narratives conveyed verbally and visually. This makes it easier for them to receive educational messages conveyed through audiovisual media, especially if they are packaged in an attractive way and touch on the emotional aspect [14]. In line with research by Leonardo which shows that the increase in knowledge among school-age children about hand washing is based on the highest score on the female gender. The use of audiovisual media is considered more effective for girls because they tend to have a higher interest in visual and narrative media [18].

The selection of health education media is also important to do, because it can help in conveying health messages so that the information provided can be received clearly and more directed [19]. The use of the audiovisual method has several advantages because it is considered more interesting and can be used more than once [20]. This is in line with research

conducted by Salsabila et al That audiovisual media, especially animated videos, is very helpful in attracting the attention of school-age children. Because in animation video media displays text, images, colors and movements so that school-age children can focus their attention. In addition, audiovisual media can be used repeatedly and anywhere, so that education can be more flexible and accessible [21].

The main factors that play a role in shaping the knowledge of school-age children are age, gender and the source of information obtained. The results of the study show that 4th grade school-age children at MINU Lumpur Gresik have never received education about CTPS which results in low initial knowledge of students. However, after education with the audiovisual method, all school-age children (100%) have good knowledge.

Supported by the content of the material, educators, facilities, methods, and supported by the right media, it can increase the knowledge of school-age children. This increase in knowledge is expected to have an impact on the mindset and behavior of school-age children.

B. KNOWLEDGE OF SCHOOL-AGE CHILDREN'S ABOUT HAND WASHING BEFORE AND AFTER HEALTH EDUCATION USING THE ROLEPLAY METHOD AT MINU LUMPUR GRESIK

Based on the results of the research, the level of knowledge of grade 4 school-age children at MINU Lumpur Gresik before and after being given health education about hand washing using the roleplay method has increased. The results of the calculation show that before health education was carried out using the roleplay method, most school-age children (75%) had not good knowledge and a small percentage (29%) had enough knowledge. Meanwhile, after health education was carried out using the roleplay method, all school-age children had good knowledge (100%).

According to the social learning theory from Bandura, it emphasizes the importance of learning through observation, imitation, and modeling. Children who see or act out a behavior such as washing their hands will find it easier to imitate it. In the role-playing method, children will also be directly involved in the activity. This makes the roleplay method very suitable for elementary school-age children, especially at the age of 10 who are mature enough to understand the social context and can reflect on the actions they do or see in role-playing [22]. In line with research by Suen & Cheung That age 10 is a productive age in receiving health education about hand washing. At this age, children can learn and re-practice hand washing skills through role-playing media [23].

Men, with a tendency to be active and exploratory, tend to be more focused and motivated when they play a direct role in an activity, such as washing their hands with the roleplay method [22]. In line with research by Tengku Jamaluddin et al shows that the way to learn for male students is to learn from real situations, so that roleplay media is an appropriate medium in increasing knowledge about hand washing in male students [24].

In addition, knowledge is influenced by information, namely someone who has more sources of information about a thing so that they have broader knowledge. According to Notoatmodjo, knowledge is the outcome of the cognitive process that begins with sensory perception of a particular object. This perception is facilitated through the five human senses sight, hearing, smell, taste, and touch [12].

Roleplay is a game of pretending to play another person in a conscious way. By using the roleplay method, school-age children can learn from other people's experiences about how to solve problems and can be used to develop themselves optimally and come up with many alternative problem-solving solutions. This theory is reinforced by the opinion Comb which states that with the roleplay learning model, it is easier for children to understand the time and reason for the importance of washing their hands with soap through firsthand experience in various situations they encounter daily [25].

The results of this study show that the roleplay method is effective in increasing hand washing knowledge in grade 4 school age children at MINU Lumpur Gresik. In this method, students receive 2-way education. Students not only receive information passively, but also actively participate in the scenarios being played. This is supported by the results of studies that show a significant increase in hand washing knowledge after being given an intervention. After the intervention, all school-age children (100%) have good knowledge.

The roleplay method allows school-age children to learn about hand washing directly through practices that resemble real situations. With this method, school-age children not only understand the theory but can also remember the steps of washing their hands better. Therefore, further research is recommended to further explore the effectiveness of roleplay in increasing knowledge about handwashing, as well as comparing it with other methods so that the results obtained are more comprehensive.

C. HAND WASHING SKILLS OF SCHOOL-AGE CHILDREN'S BEFORE AND AFTER HEALTH EDUCATION USING THE AUDIOVISUAL METHOD AT MINU LUMPUR GRESIK

The research findings indicate an improvement in the handwashing skill level of fourth-grade school-age children at MINU Lumpur Gresik following the provision of health education using the audiovisual method. Prior to the intervention, all participants (100%) demonstrated inadequate knowledge regarding proper handwashing practices. Meanwhile, after health education using the audiovisual method, most (75%) have good skills, and a small percentage (25%) have enough skills.

Skill is a person's ability to use their intellect, ideas, and creativity to accomplish or create something of value [26]. Based on the results of the study Febrina et al, school-age children who have sufficient skills after education can be influenced by age, gender and duration of education. The more often education is carried out and the suitability of the media used, the more a person's skills will also increase [27].

Based on the theory of children's motor development, the age of 10 years is a period in which fine motor skills and coordination of movements are increasingly developed, so that children are better able to imitate movements visually and apply them in practice [28]. In line with the results of the research Oura et al that the age of 10 years is an effective age in improving skills about hand washing [29].

By gender, audiovisual methods are more effective in girls, who tend to have better observation skills and visual memory than boys [30]. This is in line with research by Tri Peni et al that the improvement of personal hygiene skills in female students has increased significantly. Female students can imitate the technique of washing hands with soap using audiovisual media [31].

The duration of health education plays an important role in improving handwashing skills with soap in school-age children. Education with a longer duration and repeated ability allows children to understand, remember, and practice skills better. Research by Febrina et al shows that counseling conducted in multiple sessions is more effective than one-time education, as repetition can strengthen understanding and form healthy habits [27].

Based on research conducted by Angga et al, the results of the study showed that education using animated videos about handwashing in school-age children influenced changing students' skills regarding six-step hand washing. The delivery of information in this form can stimulate interesting school-age children who see and hear it. Audiovisual media allows children with visual and auditory learning styles to understand the material more effectively, because it combines elements of images, sounds, and movements in the learning process [32]. Based on the results of this study, the audiovisual method is effective in improving hand washing skills in grade 4 school-age children at MINU Lumpur Gresik. This method can present information in an interesting way through visuals and audio that makes it easier to understand and apply the material. This is supported by the results of the study which showed a significant increase in hand washing knowledge after being given an intervention, namely most (75%) had good knowledge and a small percentage (25%) had sufficient skills. The factor that affects the sufficient score on the post-test results is because the duration of health education is only held once in a meeting. In addition, animated video educational media is a one-way educational medium that leads to a lack of interaction with students in practice. Thus, the understanding and skills obtained are not fully optimal.

Based on this, the researcher suggests that health education be carried out more than once in a meeting to improve children's understanding and skills in applying CTPS correctly. In addition, developing animated video media or using other methods can be used to increase the effectiveness of education.

D. HAND WASHING SKILLS OF SCHOOL-AGE CHILDREN'S BEFORE AND AFTER HEALTH EDUCATION USING THE ROLEPLAY METHOD AT MINU LUMPUR GRESIK

Based on the results of the study, data was obtained on the skill level of school-age children before and after being given health education about hand washing using the roleplay method has increased. Based on the results of calculations, before health education was carried out using the roleplay method, all (100%) had not good skills. Meanwhile, after health education using the roleplay method, almost all (92%) have good skills, and a small percentage (8%) have enough skills.

According to the theory, Elizabeth B. Hurlock explains that motor development is the result of maturity and control of body movements that involve coordination between the nervous system and muscles. By the age of 10-11, children have reached a level of maturity that allows them to control movements more coordinated and efficiently. In CTPS learning, the roleplay method allows children to practice hands-washing movements directly, thus strengthening coordination between their nervous system and muscles [33]. In line with the results of the research Ping et al that the age of 10 years is an effective age in improving skills about hand washing [34].

Bandura's theory of social learning on motor development states that children learn behavior through observation and imitation, especially in fun social interactions such as role-playing. The roleplay method allows children to imitate the correct handwashing gesture directly from the given example [22]. According to research by Pratinidhi et al that education with roleplay media can improve hand washing skills in school-age children, especially in both genders, both boys and girls [35].

According to the theory of the Fogg Behavior Model (FBM), it emphasizes that the formation of new habits, including health behaviors, requires the right motivation, ability, and triggers. The duration and repetition of educational interventions can improve an individual's ability to form healthy habits [36].

Research conducted by Bellinda et al show improved skills in students after receiving health education using the role-playing method. According to Nur Hasanah, the use of the roleplay method makes children more interested and the message that will be conveyed to children can be easily accepted, considering that children are very fond of stories or dramas [37]

Based on the results of the research, the roleplay method is effective in improving hand washing skills in grade 4 school-age children at MINU Lumpur Gresik. This method allows children to learn through hands-on practice and interaction, thereby improving their understanding and skills in proper handwashing. This is supported by the results of the study which showed a significant increase in hand washing knowledge after being given an intervention, namely almost all (92%) had good skills, and a small percentage (8%) had sufficient skills. Post-test results in the category are sufficient due to the length of the duration of education. In this study, the duration of health education was only carried out in one meeting.

Health education with roleplay is an interactive educational method and can be an effective solution to improve children's ability to perform CTPS. It is recommended to conduct education with a longer duration so that the child has enough time to understand, remember, and practice CTPS skills correctly.

E. DIFFERENCES IN HAND WASHING KNOWLEDGE USING AUDIOVISUAL AND ROLEPLAY METHODS

Mann-Whitney test results showed a significance value of 0.318 (>0.05), indicating no significant difference in knowledge between the audiovisual and roleplay groups after the intervention. This suggests that both methods are equally effective in improving children's knowledge of proper handwashing.

Both audiovisual and roleplay methods increased students' awareness of the six-step handwashing process. The study of Akmal et al found that audiovisual education enhances knowledge by presenting concrete and engaging visual content [38]. The study of Solehudin also emphasized that roleplay creates meaningful learning by involving active student participation and providing practical experience [12].

The similar effectiveness of these methods is due to their ability to match different learning styles: audiovisual methods suit visual and auditory learners, while roleplay supports kinesthetic learners through movement and interaction. Continued application of both methods is recommended in school health education programs to address diverse student learning preferences.

Teachers and community nurses can select appropriate educational methods based on resource availability, time constraints, and student characteristics. For instance, audiovisual methods are more practical for large groups and tend to be more effective for female students who respond better to visual media, while roleplay is more suitable for small groups and often preferred by male students who engage more actively in role-based learning. These considerations can guide educators in tailoring educational strategies to meet the specific needs of their learners.

F. DIFFERENCES IN HAND WASHING SKILLS USING AUDIOVISUAL AND ROLEPLAY METHODS

According to the Mann-Whitney test, the significance value was 0.172 (>0.05), showing no significant difference in skill outcomes between the two methods. Thus, both audiovisual and roleplay media can be used effectively to improve handwashing skills among fourth-grade students.

Both methods helped children understand and practice handwashing. The study of Allo et al showed that audiovisual media provides clear, visual demonstrations of handwashing steps [39]. Stuttgar Ping et al found that roleplay engages multiple senses and fosters active learning, improving understanding and retention [34].

The similar effectiveness of these methods is likely due to their compatibility with different learning styles. Audiovisual media suits students with visual and auditory learning preferences, while roleplay supports kinesthetic learners through physical activity and direct interaction. Therefore, continued use of both methods in school health education programs is strongly recommended to accommodate diverse student learning preferences.

The practical implication of these findings is that teachers and school health personnel can adjust the educational methods used according to students' needs. For students with an active and kinesthetic learning tendency, particularly boys, roleplay may be a more appropriate choice. Conversely, for students who are more responsive to visual information and tend to be reflective learners, such as most of the female students in this study, audiovisual media may produce better outcomes. Therefore, implementing a blended learning approach or selecting the method that aligns with student characteristics may enhance the effectiveness of school health education programs.

V. CONCLUSION

This study aimed to determine the effectiveness of health education using audiovisual and roleplay methods in improving knowledge and handwashing skills among fourth-grade school-age children at MINU Lumpur Gresik. The findings revealed that before receiving health education using audiovisual media, most children had low knowledge, and nearly half had moderate knowledge. After the intervention, all students demonstrated good knowledge. Similarly, in the roleplay group, most children had low knowledge and a few had moderate knowledge; following the intervention, all students showed good knowledge levels.

In terms of skills, before the audiovisual intervention, all students had low handwashing skills. After the education, most showed good skills, while some had moderate skills. A similar pattern was observed in the roleplay group; before the intervention, all students had low skills, and afterward, nearly all demonstrated good skills and a few moderate levels. Health education using audiovisual media was particularly effective in increasing knowledge and skills among female students,

while the roleplay method was more effective in improving knowledge among male students and handwashing skills for both genders.

Therefore, health education using audiovisual and roleplay methods is an equally effective learning strategy and can be applied according to the characteristics and needs of the learners. Future research is recommended to explore the long-term effectiveness of these methods and how they can be sustainably integrated into routine school health education programs. Researchers may also consider using these educational methods in broader contexts or developing new, innovative approaches that align with technological advancements and student needs, to make health education more effective and sustainable.

VI. REFERENCES

[1] N. Budianti and W. R. Hidayani, "Faktor Risiko Kesehatan pada Anak Sekolah Dasar," *Buletin Ilmu Kebidanan dan Keperawatan*, vol. 1, no. 01, pp. 41–46, 2022, doi: 10.56741/bikk.v1i01.40.

[2] L. Mafazah, "Ketersediaan Sarana Sanitasi Dasar, Personal Hygiene Ibu Dan Kejadian Diare," *Jurnal Kesehatan Masyarakat*, vol. 8, no. 2, pp. 176–182, 2013, doi: https://doi.org/10.15294/kemas.v8i2.2819.

[3] UNICEF, "Memberi Peluang Terbaik Untuk Bertahan Hidup Bagi Anak-Anak." [Online]. Available: https://www.unicef.org/indonesia/id/kesehatan

[4] Sunardi and F. Ruhyanuddin, "The Impact of Hand Washing on The Incident of Diarrhea Among School-Aged Children At The District of Malang," *Jurnal keperawatan*, vol. 8, no. 1, pp. 85–95, 2017.

[5] WHO, *WHO Guidelines on Hand Hygiene in Health Care*, 1st ed. Switzerland: World Health Organization, 2009.

[6] A. Azmiardi and T. Haryanti, "Perilaku Mencuci Tangan Selama Pandemi COVID-19," *Higeia Journal of Public Health Research and Development*, vol. 5, no. 2, pp. 245–258, 2021.

[7] BPS, *Survei Kesehatan Indonesia*, 1st ed. Jakarta: Badan Kebijakan Pembangunan Kesehatan, 2023.

[8] D. Dayaningsih, D. Mulianda, A. W. Purwasih, A. Putri, I. W. Pradana, and M. A. Jarwanto, "Penyuluhan Kesehatan Tentang Cuci Tangan Pakai Sabun di SD Negeri Meteseh," *Compromise Journal : Community Proffesional Service Journal*, vol. 2, no. 2, pp. 37–50, 2024.

[9] J. Criony, "Efektifitas Media Promosi Kesehatan Audio Visual Lagu Cuci Tangan Terhadap Pelaksanaan Cuci Tangan 6 Langkah Pada Anak," *Journal of Public Health Education*, vol. 1, no. 02, pp. 57–63, 2022, doi: 10.53801/jphe.v1i02.39.

[10] R. Rivanica, S. Handayani, and M. Soleha, "Hubungan Pengetahuan Dengan Teknik Cuci Tangan Pakai Sabun (Ctps) Sesuai Sop Pada Anak Usia Prasekolah 4-6 Tahun," *Jurnal 'Aisyiyah Medika*, vol. 8, no. 2, pp. 76–79, 2023.

[11] D. Suista, G. K. Pengestu, and M. Anggraeni, "Pengaruh Penyuluhan Kesehatan, Demonstrasi Bermain dan Role Play terhadap Perilaku Mencuci Tangan pada Usia Prasekolah," *Indonesia Journal of Midwifery Sciences*, vol. 2, no. 4, pp. 335–344, 2023, doi: 10.53801/ijms.v2i4.130.

[12] Solehudin, "Pengaruh Penggunaan Metode Role Play pada Cuci Tangan yang Benar Ditinjau Dari Pengetahuan Siswa," *Jurnal Ilmiah Wijaya*, vol. 10, no. 2, pp. 58–71, 2018.

[13] D. Mahendra, I. M. M. Jaya, and A. M. R. Lumban, *Buku Ajar Promosi Kesehatan*, 1st ed. Jakarta: Program Studi Diploma Tiga Keperawatan Fakultas Vokasi Universitas Kristen Indonesia, 2019.

[14] Darsini, Fahrurrozi, and E. A. Cahyono, "Pengetahuan ; Artikel Review," *Jurnal Keperawatan*, vol. 12, no. 1, pp. 95–107, 2019.

[15] S. Rahma, P. Fika, and A. Yulia, "Pengaruh Pendidikan Kesehatan tentang Disminorhoe terhadap Tingkat Pengetahuan Remaja Putri Mengena Disminorhoe di Kelas XI SMAN 2 Banguntapan Effect of Health Education Level of Knowladge about Disminorhoe teen Prinvess Disminorhoe on in Class XI SMAN 2," *Jurnal Ilmu Kesehatan Mulia Madani Yogyakarta*, vol. 3, no. 2, pp. 37–54, 2022.

[16] F. Sabani, "Perkembangan Anak - Anak Selama Masa Sekolah Dasar (6 - 7 Tahun)," *Didakta: Jurnal Kependidikan*, vol. 8, no. 2, pp. 89–100, 2019, doi: https://doi.org/10.58230/27454312.71.

[17] S. P. Khawa, R. Deol, and S. M. Kodi, "Knowledge and Practices Regarding Personal Hygiene among Primary School Children," *International Journal Of Community Medicine And Public Health*, vol. 8, no. 11, pp. 5370–5375, 2021, doi: 10.18203/2394-6040.ijcmph20214273.

[18] C. Leonardo, "Personal hygiene:Knowledge, attitude, and practice among higher primary school children in Urban Bengaluru, India," *Journal of Emerging Technologies and Innovative Research*, vol. 10, no. 04, pp. 295–304, 2023, doi: 10.56975/brx2ja89.

[19] Nurmala, *Buku Promosi Kesehatan*, 1st ed. Surabaya: Universitas Airlangga, 2018.

[20] H. Setiyawan, "Pemanfaatan Media Audio Visual dan Media Gambar Pada Siswa Kelas V," *Jurnal Prakarsa Paedagogia*, vol. 3, no. 2, pp. 198–203, 2020, doi: 10.24176/jpp.v3i2.5874.

[21] A. A. Salsabila, H. Lala, and B. Suharno, "Pengaruh Edukasi Kesehatan PHBS Di Sekolah Terhadap Peningkatan Pengetahuan Siswa Kelas 3 SD," *Jurnal Informasi Kesehatan Indonesia*, vol. 8, no. 2, pp. 157–165, 2022, doi: 10.31290/jiki.v8i2.3355.

[22] E. Yanuardianto, "Teori Kognitif Sosial Albert Bandura," *Auladuna : Jurnal Prodi Pendidikan Guru Madrasah Ibtidaiyah*, vol. 1, no. 2, pp. 94–111, 2019, doi: 10.36835/au.v1i2.235.

[23] L. K. P. Suen and J. P. L. Cheung, "Effectiveness of 'Hand Hygiene Fun Month' for Kindergarten Children: A Pilot Quasi-Experimental Study," *International Journal of Environmental Research and Public Health*, vol. 17, no. 19, pp. 1–15, 2020, doi: 10.3390/ijerph17197264.

[24] T. Z. M. Tengku Jamaluddin *et al.*, "Assessment on Hand Hygiene Knowledge and Practices Among Pre-school Children in Klang Valley," *Global Pediatric Health*, vol. 7, 2020, doi: 10.1177/2333794X20976369.

[25] S. Heru, *Roleplay*, 1st ed. Jakarta: Kementerian Pendidikan dan Kebudayaan, 2013. doi: 10.5040/9780571285617.00000027.

[26] N. Nasihudin and H. Hariyadin, "Pengembangan Keterampilan dalam Pembelajaran," *Jurnal Pendidikan Indonesia*, vol. 2, no. 4, pp. 733–743, 2021, doi: 10.36418/japendi.v2i4.150.

[27] W. Febrina, R. Dewi, W. Lazdia, and S. Oktavia, "Edukasi Perilaku Cuci Tangan Pakai Sabun Dalam upaya Pencegahan Penyebaran Covid-19," *Empowering Society Journal*, vol. 3, no. 2, pp. 120–127, 2022.

[28] Y. Siti, K. Nina, and A. Mona, "Penerapan Metode Latihan Dengan Menggunakan Media Audio Visual Dalam Tari Kreasi Untuk Meningkatkan Motorik Kasar Pada Kelompok B," *Jurnal Ilmiah Potensia*, vol. 5, no. 1, pp. 25–30, 2020, doi: https://doi.org/10.33369/jip.5.1.25-3x Siti.

[29] A. Oura, Y. Naito, H. Yako-Suketomo, K. Nakata, M. Koyama, and H. Ohnishi, "Science Behind Children's Handwashing: Action Study Of 9- to 10-Years-Old Elementary School Students in Japan," *Frontiers in Public Health*, vol. 12, pp. 1–7, 2024, doi: 10.3389/fpubh.2024.1425646.

[30] F. Fatmawati, M. Y. Hidayat, E. Damayanti, and M. R. Rasyid, "Gaya Belajar Peserta Didik Ditinjau Dari Perbedaan Jenis Kelamin," *Al asma : Journal of Islamic Education*, vol. 2, no. 1, p. 23, 2020, doi: 10.24252/asma.v2i1.13472.

[31] Tri Peni, Heri Triwibowo, and Sindy Aprilia, "The Effect of Audio Visual Health Education Method on Increasing Adolescent Girls' Knowledge About Personal Hygiene During Menstruation," *Journal of Scientific Research, Education, and Technology (JSRET)*, vol. 2, no. 2, pp. 762–768, 2023, doi: 10.58526/jsret.v2i2.160.

[32] W. Angga, S. Sajodin, H. Putri, Y. Suzana, and S. Zahrah, "Edukasi Mencucui Tangan Berbasis Vidoe Animasi: Dampak

Terhadap Pengetahuan Siswa Sekolah Dasar," *Jurnal keperawatan Aisyiyah*, vol. 10, no. 1, pp. 65–72, 2023.

[33] U. Rima, "Konsep Skinner Tentang Pembentukan Perilaku pada Pendidikan Anak Usia Dini," UIN Sunan Kalijaga Yogyakarta, 2015.

[34] M. F. Ping, F. N. Sari, and M. Taufiqurrahman, "Role Play in Health Education Health and Clean Lifestyle Behavior Through Hand Washing," *Salus Publica: Journal of Community Service*, vol. 1, no. 2, pp. 53–57, 2023, doi: 10.58905/saluspublica.v1i2.175.

[35] S. A. Pratinidhi, S. V. Haribhakta, D. A. Ambike, O. Bhole, and B. Kankariya, "Study of Knowledge and Practices Related to Handwashing in School Going Children of a Rural Community," *International Journal of Contemporary Pediatrics*, vol. 7, no. 1, p. 24, 2019, doi: 10.18203/2349-3291.ijcp20195569.

[36] I. R. Simorangkir, K. Manurung, and R. Sembiring, "Faktor-Faktor Perilaku Cuci Tangan Pakai Sabun (CTPS) pada Siswa SDN 177040 Desa Siabal-Abal I Tahun 2022," *Jurnal Kesehatan Poltekkes Kemenkes RI Pangkalpinang*, vol. 10, no. 2, pp. 139–147, 2022.

[37] M. F. Bellinda, F. Rachmadi, and D. Priyono, "Pengaruh Pendidikan Kesehatan Cuci Tangan Pakai Sabun Dengan Metode Storytelling Menggunakan Finger Puppet (Boneka Jari) Terhadap Kemampuan Mencuci Tangan Pada Anak Usia Prasekolah Di Paud Pagi Ceria Pontianak Utara," *Pro Ners*, pp. 3–6, 2019.

[38] D. Akmal *et al.*, "Promosi Kesehatan Menggunakan Media Audio Visual Terhadap Peningkatan Pengetahuan Mencuci Tangan Pada Siswa/i," *Edu Masda Journal*, vol. 7, no. 2, pp. 145–153, 2023.

[39] O. A. Allo, C. Bannepadang, and J. Silamba, "Pengaruh Penyuluhan Melalui Media Audio Visual Terhadap Kemampuan Cuci Tangan Pakai Sabun pada Siswa Kelas IV SDN 1 Bangkelekila' Kabupaten Toraja Utara Tahun 2021," *LPPM: Jurnal Ilmiah Kesehatan Promotif*, vol. 6, no. 1, pp. 37–49, 2021, doi: https://doi.org/10.56437/jikp.v6i1.55.