

The Influence of PHBS and CTPS Education on Increasing Student Knowledge at SD Negeri 04 Air Hitam Village, Datuk Lima Puluh District

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Abstract

Purpose: This study aims to increase knowledge and awareness of clean and healthy living behavior (PHBS) and handwashing with soap (CTPS) in fourth grade students at SD Negeri 04 Air Hitam Village, Batubara Regency through interactive and participatory educational activities.

Method: The method used was a quantitative pre-experimental study with a one-group pre-test and post-test design involving 49 fourth-grade students. Educational activities included interactive lectures, discussions, CTPS practice simulations using songs, illustrative images, and educational games tailored to the children's characteristics.

Practical Applications: The results showed a significant increase in the average knowledge score from 6.35 to 8.12, as well as an increase in the proportion of students with good knowledge from 61.2% to 91.8%. Furthermore, students demonstrated high enthusiasm and a temporary change in attitudes toward handwashing practices. Teachers responded positively and stated the need for similar, ongoing activities to support the formation of healthy habits. Challenges to implementation included limited handwashing facilities, crowded classrooms, and limited time.

Conclusion: This study emphasizes the importance of a holistic approach involving teachers, parents, and facility management so that the implementation of PHBS and CTPS can be sustainable and have a real impact on behavioral changes in the school environment.



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Introduction

The Clean and Healthy Living Behavior Program (PHBS) is one of the efforts designed to improve public health. All activities or behaviors related to health carried out in daily life, whether at home, school, or in public places, are included in PHBS. The purpose of PHBS is to provide opportunities for communities, families, or community organizations to learn clean and healthy living habits (Prihastini et al., 2024). Habits that are intentionally practiced by the community are referred to as Clean and Healthy Living Behavior (PHBS), which are consistently applied every day to achieve a level of health that enables them to live a healthy and active lifestyle. The goal of PHBS is to raise public awareness, enabling individuals to consciously adopt behaviors that promote and maintain health. Achieving and sustaining health can be accomplished through healthy habits and a supportive environment, which help prevent disease-related disorders. Therefore, adopting clean and healthy lifestyle choices is a shared responsibility for everyone. Unhealthy habits put individuals at risk of developing diseases (M Teguh Saefuddin¹, Tia Norma Wulan² & 1, 2, 3, 2023).

The intellectual age group generally ranges from 7–15 years old. Schools, as educational institutions as well as learning centers, can become risky places for disease transmission if not properly managed (Junaiddin et al., 2024). In fact, schools have the potential to serve as effective facilities for instilling healthy living habits through the implementation of preventive strategies. However, school health is still often neglected (Junaiddin et al., 2024). The low application of Clean and Healthy Living Behavior (PHBS) among elementary school children is closely linked to various health problems, such as worm infestations, diarrhea, and acute respiratory infections (ARI). Data from the Ministry of Health shows that out of every 1,000 Indonesians, 300 suffer from diarrhea each year. Moreover, according to the World Health Organization (WHO), diarrhea causes the death of around 100,000 children in Indonesia every year. Of these, 40–60% of deaths are triggered by worm infections, 23.2% are related to anemia in school-aged children, and 74.4% are caused by tooth damage. Therefore, prevention efforts by promoting the implementation of PHBS are urgently needed. The PHBS concept can be used as the foundation for carrying out socialization activities, both in the family environment and at school (Puteri & Yuristin, 2021).

Handwashing habits should be instilled in children from an early age. This habit is very important because hands are the part of the body most frequently in direct contact with the mouth, so their cleanliness must always be maintained, especially before and after meals, after using the toilet, and before or after handling food (Elvira et al., 2021). Proper handwashing using soap is the simplest yet most effective way to prevent the spread of various diseases. Washing hands with soap and water not only removes dust and dirt from the skin's surface but also reduces the number of bacteria, viruses, and parasites that cause disease. In fact, washing hands with soap and running water is the best way to eliminate dirt and worm eggs that stick to the skin, nails, and fingers (Elvira et al., 2021).

Schools serve as the main focus for teaching students about healthy habits. Indonesia has more than 250,000 educational institutions, covering all levels of public, private, and religious schools. It is estimated that there are 73 million school-aged children, or about 30% of the total population. The large number of children in schools represents an important resource for future progress, whose health must be maintained, improved, and protected. Schools play an important role in children's lives and should be effectively utilized as institutions that support the growth and development of school-age children through promotive and preventive measures. According to a 2019 report from the Kampar District Health Office, there is a high prevalence of diseases related to poor hygiene habits, including 2,172 cases of scabies, 895 cases of skin disorders, 1,192 cases of dengue fever, 2,767 cases of typhoid, 55 cases of worm infestation, and 12,253 cases of diarrhea (Puteri & Yuristin, 2021).

However, objective conditions at SD Negeri 04, Air Hitam Village, indicate that the implementation of PHBS (Cleanliness, Health, and Hygiene) and CTPS (Handwashing, Washing, and Sanitation) is still suboptimal. Initial observations revealed that most students

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were not yet accustomed to washing their hands with soap before eating or after activities outside the classroom. Brief interviews with teachers also revealed that limited handwashing facilities, a lack of clean water and soap, and minimal supervision were major obstacles. Social and cultural factors also played a role, such as the persistent perception that handwashing is only necessary when hands are visibly dirty.

Limited school sanitation facilities, low student awareness, and minimal health education highlight the urgency of conducting this research in Air Hitam Village. Through education and instilling healthy behaviors, it is hoped that students will improve their knowledge, which will ultimately lead to changes in attitudes and practices of daily hygiene. Therefore, this study aimed to determine the effect of PHBS and CTPS education on improving student knowledge at SD Negeri 04, Air Hitam Village, Batubara Regency.

Method

This study employed a quantitative research method using a pre-experimental design with a one-group pre-test and post-test. The study was conducted in August 2025 at SD Negeri 04, Air Hitam Village, Datuk Lima Puluh District, Batubara Regency. The subjects were all 49 fourth-grade students selected through a total sampling method. The activities began with a pre-test to determine students' initial knowledge, followed by health education on PHBS (Clean and Healthy Living) and CTPS (HWWS) through interactive lectures, discussions, and simulations of the six steps of handwashing with soap, as well as the use of illustrative images, songs, and educational games. Students were then given a post-test to assess their knowledge gains. The activity concluded with a reflection and question-and-answer session to reinforce the health messages. The entire series of activities took place in one day, sequentially progressing from pre-test, education, practice, post-test, and reflection. Thus, this research method not only measured changes in knowledge but also emphasized active student participation and an educational approach appropriate to the characteristics of fourth-grade elementary school students.

Result

Table 1. Gender

No	Gender	N	F
1	Male	21	42.9%
2	Female	28	57.1%
Total		49	100%

Source: Author's Work, 2025.

Of the 49 respondents, 21 were male (42.9%) and 28 were female (57.1%). This data indicates that the majority of respondents at SD Negeri 04 are female. The higher number of female respondents may be influenced by factors such as time availability, interest, and their tendency to be more active in various activities, particularly those related to health.

Table 2. Analysis of correct answers to the level of knowledge in the pre-test and post-test

	Mean	N	Std. Dev	Std. Mean
Pre test	6.35	49	2.194	0.313
Post test	8.12	49	1.799	0.257

Source: Author's Work, 2025.

The mean score of respondents' knowledge before the pre-test was 6.35 with a standard deviation of 2.194, while after the post-test it increased to 8.12 with a standard deviation of 1.799. This increase in the mean reflects an increase in respondents' knowledge after receiving education or counseling. Furthermore, the decrease in the standard deviation indicates that variations in knowledge among respondents are decreasing, thus concluding that participants' understanding has become more evenly distributed after the activity.

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Table 3. Analysis of Student Knowledge Categories Based on Pre-test and Post-test Results at SD Negeri 04 Air Hitam in 2025

Category	Pre-Test		Post-Test	
	n	%	n	%
Amateur	19	38,8	4	8,2
Expert	30	61,2	45	91,8
Total	49	100	49	100

Source: Author's Work, 2025.

During the pre-test, 19 respondents (38.8%) had a knowledge level in the Poor category, while 30 respondents (61.2%) were in the Good category. After the education, there was a significant improvement: only 4 respondents (8.2%) remained in the Poor category, while 45 respondents (91.8%) were in the Good category. This indicates that the education provided was effective in increasing respondents' knowledge, with a significant shift from the poor to good category.

The health education activity on Clean and Healthy Living Behavior (PHBS) and Handwashing with Soap (CTPS) at SD Negeri 04 Air Hitam Village was attended by 49 students with great enthusiasm. This was evident from their eagerness to follow the handwashing movements accompanied by music, as well as their active participation in answering interactive questions from the KKN team. Some students even spontaneously demonstrated the habit of washing their hands before eating their lunch, although it was still within the context of the activity.

In terms of outcomes, the evaluation showed an increase in students' knowledge. The average pre-test score of 6.35 rose to 8.12 in the post-test. The percentage of students categorized as having good knowledge also increased from 61.2% to 91.8%. These results confirm that the education provided was able to improve students' understanding in a relatively short period of time. However, the activity was not without challenges. Some students appeared less focused, especially at the beginning of the session. Limited facilities, such as the absence of a projector to show educational videos, meant that the delivery of material relied mainly on posters and direct practice. In addition, the small classroom and limited time became obstacles, preventing the discussion session from being conducted in greater depth.

Teachers responded positively to the activity. They felt that the combination of direct practice and educational games made it easier for students to understand and engage with the health messages. Teachers also emphasized the importance of conducting such activities regularly in order to truly instill clean and healthy habits among students.

Based on observations, there were signs of temporary behavioral changes among the students. They were more eager to practice the steps of CTPS, able to recall the sequence of movements correctly, and showed curiosity by asking simple questions about the benefits of handwashing. Nevertheless, long-term behavioral change cannot be confirmed, as there was no follow-up to monitor students' habits after the activity ended. Therefore, the results mainly highlight short-term improvements in knowledge and awareness rather than sustainable behavior change or institutional support within the school.

Discussion

The pre-test findings indicated that almost all students had limited understanding of the steps of handwashing with soap (CTPS) or the principles of Clean and Healthy Living Behavior (PHBS). However, after receiving education and taking the post-test, there was a significant improvement in their understanding of both aspects. This demonstrates that the educational intervention effectively enhanced students' comprehension of the importance of CTPS as a preventive strategy against the transmission of infectious diseases through hands, including diarrhea, worm infestations, and acute respiratory infections (ARI). The Ministry of Health of the Republic of Indonesia has established standards that must be followed to ensure the optimal impact of handwashing with soap (CTPS). As stated by the Directorate of Elementary

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Schools (2021), the procedures include: 1. washing hands with clean water; 2. using sufficient soap; 3. rubbing palms and between the fingers; 4. rubbing fingers while rotating them in the palm; 5. rubbing the backs of fingers on the palm; 6. cleaning thumbs with a circular motion; 7. rubbing fingertips on the palm; 8. rinsing hands under running water; and 9. drying hands with tissue or disposable cloth.

Based on Table 1, the majority of respondents in this study were female, totaling 28 students (57.1%), while male respondents numbered 21 (42.9%). This shows that female students were more dominant in participating in PHBS and CTPS educational activities. These findings are consistent with previous studies stating that females tend to be more active in hygiene- and health-related activities. In terms of comprehension, there was no significant difference between male and female students when receiving information about CTPS. However, participation and positive responses were more prominent among females.

The analysis of Table 2 revealed an increase in the average knowledge score from 6.35 in the pre-test to 8.12 in the post-test. In addition, the decrease in standard deviation from 2.194 to 1.799 indicates that students' knowledge after the intervention became more evenly distributed. This confirms that health education had a positive impact on students' understanding of PHBS and CTPS. This study is in line with the findings of Natsir (2020) regarding "The Effect of CTPS Counseling on Improving Students' Knowledge at SDN 169 Bonto Parang, Jeneponto District." The results showed that students' knowledge scores increased after the post-test compared to the pre-test, proving that CTPS counseling successfully improved comprehension. Thus, the success of health education can be seen from the increase in respondents' knowledge after receiving educational material.

Furthermore, the results in Table 3 demonstrated a significant shift in the students' knowledge categories. Before the education, 19 students (38.8%) were in the "poor knowledge" category, while 30 students (61.2%) were in the "good knowledge" category. After the education, the "poor" category decreased drastically to 4 students (8.2%), while the "good" category increased to 45 students (91.8%). This shift proves that education is highly effective in improving students' knowledge. These findings are consistent with the study by Salsabila et al. (2022) at SDN Bakalan Krajan 2, Malang, which showed a significant increase in students' knowledge of PHBS after receiving education, from an average score of 53 (poor category) to 80 (good category), with a p -value < 0.001 . Similarly, a study by Rahmadina et al. (2023) at SD Al-Irsyad, Batu City, found that all students experienced an improvement in knowledge, entering the "good" category after the PHBS promotion intervention ($p < 0.05$). In conclusion, this study proves that PHBS and CTPS education significantly contributed to improving students' knowledge at SD Negeri 04 Air Hitam, Datuk Lima Puluh Subdistrict. This is consistent with the theory that health education can expand knowledge, correct misconceptions, and shape healthier mindsets.

The increase in students' knowledge after participating in PHBS and CTPS education can be explained through the methods of health promotion used. The material was delivered in a simple, engaging, and interactive way, such as through pictures, educational games, and direct demonstrations of proper handwashing techniques. This approach encouraged students to be more active and made the information easier to understand and remember. Post-test results showed that more than 80% of students were able to answer correctly and practice the CTPS steps according to standards. This indicates a significant improvement in understanding compared to before the training. These findings are consistent with previous studies, which showed that practice-based and visual learning methods are highly effective in improving school children's health knowledge.

From a teaching perspective, this approach was also considered very effective. Activities such as Q&A sessions, reward giving, and interactive games helped boost students' motivation and created a more enjoyable learning environment. The practical approach also provided real experience, allowing students not only to understand the theory but also to develop proper handwashing skills. Therefore, this method is highly suitable for use in elementary schools as part of health education and as an effort to encourage clean living

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habits. This educational method can also be applied in other elementary schools with different conditions. Since it is simple, low-cost, and easy to adapt, similar activities can be carried out using only basic facilities such as clean water and soap. Strategies can also be adjusted according to students' characteristics and the surrounding environment. If implemented regularly, PHBS and CTPS education programs have the potential to become effective health learning models in shaping clean habits from an early age. Nevertheless, this study has several limitations. First, there was no control group that did not receive the intervention, making it difficult to draw direct comparisons. Second, the limited time reduced the effectiveness of the Q&A session, leaving some students without a full understanding of the material. In addition, constraints such as overcrowded classrooms and the absence of a projector also hindered the delivery of the material. These factors need to be addressed in future studies and implementations to ensure more comprehensive and measurable results.

Conclusion

A study conducted at SD Negeri 04 in Air Hitam Village found that education on Clean and Healthy Living Behavior (PHBS) and Handwashing with Soap (CTPS) significantly improved students' knowledge. Pre-test results showed an average score of 6.35, and post-test results increased to 8.12. Furthermore, the proportion of students with good knowledge increased from 61.2% to 91.8%. This was due to learning activities that included hands-on practice, games, and visual media, which engaged students and helped them remember the steps of CTPS correctly. These activities were shown to increase students' awareness and knowledge in the short term, although long-term behavioral changes are uncertain. The results indicate that schools, with teacher support and supervision, can make handwashing a routine practice, especially before meals and after activities. To ensure this practice is consistently implemented, handwashing facilities, clean water, and soap are required. Furthermore, teachers are expected to incorporate PHBS education into their teaching and learning activities by using interactive learning approaches and modeling handwashing for their students. However, there are several potential structural barriers to consider. Not all schools have clean water, soap, and adequate toilets, especially in rural areas. Furthermore, budget constraints often hinder the provision of hygiene facilities, while teachers are very busy human resources, making it difficult to monitor students' habits. Socioculturally, some people believe that handwashing is only necessary when hands are visibly dirty. Consequently, maintaining healthy habits is difficult without the support of family and the surrounding community.

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