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The Effect of PHBS Education on Student Behavior in Maintaining the Cleanliness of the Primary School Environment

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ABSTRACT

The implementation of Clean and Healthy Living Behavior (PHBS) in primary schools is a strategic step in shaping students' character to care about cleanliness and environmental health. However, student behavior in maintaining school hygiene is often not optimal due to limited understanding and awareness of PHBS. Purpose: This study aims to determine the effect of PHBS education on student behavior in maintaining environmental cleanliness at SD Anduring, Padang. Method: A quantitative approach with a pre-experimental one-group pretest–posttest design was applied. The sample consisted of 50 students from grades IV and V selected purposively. Instruments used were validated questionnaires and observation sheets to measure changes in student behavior before and after education. The PHBS intervention was conducted through interactive counseling, including lectures, handwashing practice demonstrations, and audiovisual media, delivered in two sessions over two weeks. Results: Findings showed a significant improvement in hygiene behaviors such as proper waste disposal, classroom cleaning, and participation in environmental hygiene activities, with a significance value of $p < 0.05$. Implications: These results indicate that PHBS education is effective in increasing students' awareness and responsibility toward the school environment and can be integrated into thematic learning and extracurricular activities. Conclusion: PHBS education has a positive and significant effect on student behavior in maintaining school cleanliness at SD Anduring Padang and is feasible to be developed as part of school culture.

Keywords: *PHBS Education, Student Behavior, Environmental Hygiene, Elementary School*

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INTRODUCTION

Health education that emphasizes Clean and Healthy Living Behavior (PHBS) plays an important role in creating a healthy and conducive school environment for teaching and learning. By instilling hygiene and health values from an early age, elementary schools become strategic institutions for forming positive habits that students can carry throughout their lives. PHBS not only affects physical health but also improves concentration and enthusiasm for learning, which ultimately supports academic achievement.

A clean and healthy school environment is a prerequisite for a comfortable and optimal learning atmosphere. Primary schools are not only centers of knowledge transfer but also have a role in shaping character and healthy habits. Student behavior in maintaining school cleanliness is strongly influenced by health education, particularly through the PHBS program. PHBS in schools is defined as efforts to habituate students to practice healthy lifestyles such as washing hands with soap, disposing of waste properly, keeping toilets clean, consuming healthy food, and maintaining classroom and schoolyard cleanliness (Priliana & Herlina, 2022). Education on PHBS is designed to increase knowledge and shape attitudes and skills in hygiene (Aslina & Liana, 2023).

Previous studies show that many students still face challenges such as littering, improper handwashing, and neglect of school facility cleanliness (Rawalilah, 2018). These behaviors increase the risk of infectious diseases, reduce comfort, and disrupt learning. Therefore, PHBS education is an effective strategy to raise awareness and improve behavior toward environmental hygiene (Santoso & Sa'adah, 2021).

PHBS education in schools is delivered through lectures, demonstrations, games, and integration into the curriculum (Dayani, Pradikta & Rizkiana, 2024). Teachers serve as role models, while parents at home also contribute to shaping behavior (Hearisa, Meliyanti & Marita, 2023). With the right approach, students are expected not only to understand but also to internalize clean and healthy habits. However, the implementation of PHBS in Indonesia is still below the national target. Riskesdas and Media Indonesia (2024) report that only 56.8 percent of schools consistently implement PHBS. Limitations in facilities such as toilets, water supply, and handwashing stations hinder efforts, especially in rural schools (Wulan et al., 2023). The same situation occurs in West Sumatra, including at SD Anduring Padang, where sanitation facilities are not yet optimal.

Research by Fitriana et al. (2023) at SDN 224 Mannyampa, South Sulawesi, shows that PHBS education using lectures, videos, and games successfully increased student knowledge. A similar study by Yulianto et al. (2023) at SDN Bakalan Krajan 2, Malang, also showed a significant increase in knowledge and behavior after audiovisual and practice-based education. A literature review by Sari et al. (2024) confirms that education alone is not enough, and improvements in infrastructure and support from schools and families are necessary.

In East Kalimantan, Ningsih (2023) found that demonstrations of handwashing and dental hygiene at SDN 025 Lempake, Samarinda, not only improved knowledge but also resulted in behavior change. This model is relevant for application in other schools, including SD Anduring Padang, with adaptation to local cultural conditions.

Although many studies on PHBS have been conducted in various regions, there is still a lack of research in West Sumatra, especially in Padang City. The socio cultural environment, geographic conditions, and school infrastructure in this area require local approaches. The limited number of studies highlights the importance of examining PHBS education at SD Anduring Padang.

Based on this background, this study aims to analyze the effect of PHBS education on student behavior in maintaining school cleanliness at SD Anduring Padang. The findings are expected to provide

evidence for developing effective PHBS strategies and serve as a reference for policymakers and schools in creating a healthy and conducive learning environment.

METHODS

This study used a quantitative approach with a pre-experimental design, namely a one-group pretest–posttest design, to determine the effect of Clean and Healthy Living Behavior (PHBS) education on student behavior in maintaining environmental cleanliness at SD Anduring Padang. The research sample consisted of 50 students from grades 4 and 5 who were selected purposively.

Data were collected using a structured questionnaire and direct observation. The questionnaire consisted of 20 items that had been validated by experts in public health education. The instrument measured three aspects of hygiene behavior: (1) knowledge (understanding of clean and healthy behavior), (2) attitudes (student responses and motivation toward PHBS), and (3) practices (daily hygiene habits in the school environment). Each item was measured using a 4-point Likert scale ranging from "never" to "always," allowing quantitative assessment of changes before and after the intervention. The educational intervention was delivered through interactive counseling consisting of lectures, demonstrations of proper handwashing, and the use of audiovisual media. The activities were carried out in two sessions within a two-week period.

Data analysis was conducted using the paired sample t-test to compare pretest and posttest scores of student behavior. In addition, observations on the cleanliness of classrooms, toilets, and the schoolyard were carried out using a checklist to support questionnaire findings and provide a real picture of changes in student behavior. The questionnaire was tested for validity using Pearson's product-moment correlation and for reliability using Cronbach's alpha, ensuring that the instrument was valid and reliable for measuring PHBS-related behavior.

This methodological approach was chosen to obtain clear evidence of the short-term impact of PHBS education and to generate recommendations for schools in developing more comprehensive health programs.

RESULTS

The results of the study on the influence of PHBS education on student behavior in maintaining the cleanliness of the school environment obtained the following results:

1. Frequency Distribution of Student Hygiene Behavior Before and After PHBS Education

Table 1. Frequency Distribution of Student Hygiene Behavior Before and After PHBS Education

Categories Of Behavior	Pretest	Posttest
Good	15 (30%)	38 (76%)
Enough	20 (40%)	10 (20%)
Less	15 (30%)	2 (4%)
Total	50 (100%)	50 (100%)

This table shows the distribution of students ' hygiene behavior before and after receiving PHBS education. There was a significant increase in the "Good " category from 30% to 76%, while the "less" category decreased dramatically from 30% to only 4%. This indicates that PHBS education has succeeded in improving student hygiene behavior in general.

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2. The Effect of PHBS Education on Student Behavior in Maintaining the Cleanliness of the School Environment

Table 2. Comparison of Students 'Average Hygiene Behavior Score Before and After PHBS Education

Variable	N	Mean Pretest	Mean Posttest	Mean Difference	p-value (Paired t-test)
Hygiene Behavior	50	65.2	82.5	17.3	<0.001

This table presents the results of the statistical test paired sample t-test to see the difference in the average scores of students ' hygiene behavior before and after PHBS education. There was an increase in the average score from 65.2 to 82.5 with a difference of 17.3 points. A p-value of less than 0.001 indicates that the increase is statistically significant. Thus, it can be concluded that PHBS education has a positive and significant influence on improving student hygiene behavior.

DISCUSSION

1. Frequency Distribution of Student Hygiene Behavior Before and After PHBS Education

The results of univariate analysis in this study showed a significant increase in student hygiene behavior after being given education about clean and Healthy Living behavior (PHBS). The frequency distribution showed that the percentage of students classified as having good hygiene behavior rose dramatically, from 30% at the pretest stage to 76% after educational intervention at the posttest stage. In contrast, the category of students with less behavior decreased sharply from 30% to only 4%. This change shows that PHBS education is able to effectively influence and improve students ' hygiene habits in the primary school environment.

This improvement in hygiene behavior not only reflects a better understanding of the importance of PHBS, but also demonstrates the success of the educational methods applied at SD Anduring Padang. Education that is interactive and involves hands-on practice seems to be a key factor in shaping real behavior change. Thus, these results indicate that structured and sustainable educational interventions have great potential to create a culture of clean and healthy living that students can maintain in the long term.

This finding is in line with research conducted by Fitriana et al. (2023) in South Sulawesi, which showed a significant improvement in hygiene behavior after audiovisual and hands-on media-based PHBS educational interventions. Another study by Yulianto and colleagues (2023) in Malang also confirmed that education with an interactive approach was able to increase the healthy behavior category of students by up to 70%. Both studies support evidence that varied and contextual educational methods are effective in improving PHBS in elementary school-aged children.

In addition, these results are in accordance with the Riskesdas 2023 report which states that one of the main factors for the low quality of PHBS in schools is the lack of knowledge and understanding of students about the importance of clean and healthy living. Proper education is able to fill these shortcomings and change the behavior of students in a real way. These national Data provide an important foundation for corroborating local research results that show the positive effects of educational interventions on elementary school students.

The Social Cognitive Theory proposed by Bandura (2020) is very relevant in explaining the process of behavior change that occurs in students after getting clean and healthy behavior education (PHBS). This theory affirms that learning does not only occur through verbal instructions, but also

through a process of observation of models or examples carried out in a real way. By seeing and observing the right actions, individuals can imitate and learn new, positive behaviors.

In the context of this study, PHBS Education held at SD Anduring Padang is not only theoretical, but also involves direct practical demonstrations such as washing hands properly and maintaining the cleanliness of the school environment. Through this approach, students get a concrete learning experience and can see firsthand how the healthy behavior is carried out. This hands-on experience is very important because it increases students ' understanding and motivation to apply the same behavior in their day to day.

In addition, the internalization of healthy behaviors becomes stronger when the student feels capable and confident of carrying out the action. Social Cognitive Theory emphasizes the importance of self-efficacy or self-confidence in performing new behaviors. With the provision of education that involves real practice, students not only know what to do, but also feel confident that they are capable of doing it. This ultimately helps to form sustainable clean and healthy living habits in the school environment.

Recent research by Sari and friends (2024) also emphasizes the importance of educational interventions accompanied by environmental support to ensure the sustainability of clean living behavior. This confirms that the results of improving student behavior in SD Anduring Padang not only because of education, but also because the school environment that supports these changes. Therefore, the synergy between education and environmental conditions is the key to the successful implementation of PHBS.

Univariate analysis of this study showed that PHBS education not only improved hygiene behavior in general, but also specifically succeeded in reducing bad habits of students, such as littering. This decrease in negative behavior is an indication that education is able to change the mindset and habits of students towards more responsible behavior in maintaining the cleanliness of the school environment. This is evidence that educational interventions can have a real impact on changing students ' daily behavior.

These findings are in line with research conducted by Wulan et al. (2023), which states that increasing student awareness of the importance of maintaining cleanliness has a positive correlation with improving hygiene behavior in the school environment. In the study, interventions that focused on understanding the impact of hygiene behaviors on Environmental Health and comfort managed to foster greater awareness and responsibility in students. Education that is designed thoroughly and applicatively is the key to success in shaping positive behavior.

In addition, the research of Wulan et al. affirming that the formation of this awareness not only has a short-term impact, but also has the potential to form sustainable clean living habits if supported by consistent reinforcement. Therefore, the results of the univariate analysis in this study strengthen the argument that PHBS education is an effective strategy in overcoming bad habits and Building Healthy Living behaviors that are the foundation for the health of students and the school environment as a whole.

In addition, research conducted by Ningsih et al. (2023) in East Kalimantan showed that educational activities involving practical demonstrations and participatory activities were able to increase student motivation and compliance in implementing PHBS. This study is in line with the findings at SD Anduring Padang, which also applied a similar method so that it managed to significantly improve student hygiene behavior.

However, the researcher also noted that PHBS education must be continuously carried out so that this positive behavior becomes an inherent habit. As stated by Sari et al. (2024), a one-time

intervention is not sufficient to maintain behavior change in the long term. A sustainable approach with regular monitoring and reinforcement needs to be part of the health education program in schools.

Interim conclusions from the results of univariate analysis in this study indicate that clean and healthy behavior education (PHBS) proved effective in improving the hygiene behavior of students in SD Anduring Padang. A significant increase in the good hygiene behavior category confirms that educational interventions are able to positively change students ' attitudes and habits. This is an indication that education that is structured and carried out systematically has an important role in the formation of healthy living habits in the primary school environment.

This research provides an important contribution as empirical evidence that supports the implementation of health education programs that are contextual and appropriate to student needs. The success of PHBS education in this study confirms that an approach involving interactive methods and hands-on practice can increase students ' understanding and motivation in maintaining personal and environmental hygiene. Thus, the results of this study can be a reference for other schools in designing and implementing effective health education programs.

However, to achieve more optimal and sustainable results, the researchers suggest that schools and policy makers pay attention to the continuity of the implementation of PHBS education. In addition, the integration of education programs with the provision of supporting facilities such as handwashing, clean water, and proper toilets is a key success factor. With the support of adequate infrastructure, clean and healthy living behavior can be an inherent culture and run consistently by all school residents.

2. The Effect of PHBS Education on Student Behavior in Maintaining the Cleanliness of the School Environment

The results of this study showed a significant increase in the average score of student hygiene behavior after receiving education about clean and Healthy Living behavior (PHBS). Before the education was given, the average hygiene behavior score of students was at 65.2, which reflects the hygiene behavior that is still classified as moderate. However, after the educational intervention was carried out, this average score increased markedly to 82.5 at the posttest stage. This increase indicates a significant positive change in the hygiene habits of students in the primary school environment.

Statistically, the difference between pretest and posttest scores was shown to be significant with a p value of less than 0.001. This indicates that the improvement in hygiene behavior is not a mere coincidence, but a direct result of the PHBS education program implemented. These findings reinforce the hypothesis that systematic and structured educational interventions can be an effective tool in modifying student behavior in a healthier and cleaner direction.

Furthermore, these results provide empirical evidence that PHBS education can significantly and sustainably change students ' habits. A significant increase in the hygiene behavior of students in SD Anduring Padang indicates that the educational methods used are able to reach and motivate students to internalize the values of clean and healthy living. Thus, a well-designed health education program not only increases knowledge, but also promotes positive and long-lasting behavior change.

These findings are in line with research conducted by Ramadhan et al. (2023) in West Java who reported a significant improvement in student hygiene behavior scores after the implementation of a hands-on practice-based education program. The study showed that learning methods that involve practice and active participation of students can increase understanding and motivation to maintain cleanliness. Similarly, studies by Harahap et al. (2024) in North Sumatra confirmed that an interactive and contextual approach to education contributes to the improvement of healthy student behavior in a sustainable manner.

Research conducted by Putri (2023) in South Sulawesi shows results that are in line with the findings of this study, namely PHBS educational interventions have a real positive impact on increasing the habit of washing hands and throwing garbage in place among elementary school students. The study confirms that educational approaches that combine aspects of theory and practice directly in the school environment are very effective in shaping clean and healthy living behavior. The application of practice-based education allows students to understand the importance of hygiene through real experiences, so that positive behavior is easier to internalize.

In addition, research by Nugraha (2023) in East Kalimantan adds an important perspective regarding PHBS education delivery methods. In his study, Nugraha underlined the role of audiovisual media as an educational tool that is able to strengthen health messages visually and audibly. The use of audiovisual media is proven to make educational materials more interesting, understandable, and memorable for students. This is an effective strategy in conveying complex information about clean and healthy living behavior, especially for elementary school-aged children who tend to be more responsive to visual and audio stimuli.

Both studies provide empirical evidence that supports the importance of implementing PHBS education that is not only conceptual, but also implemented practically and supported by learning media that match the characteristics of students. This interactive and multisensory educational approach is the key to success in shaping sustainable healthy living behaviors in the school environment. Thus, the integration of practical educational methods and audiovisual media can be an effective model in health education programs in primary schools.

The behavioral Change Model theory adapted by recent health researchers emphasizes the importance of empowering individuals through increased knowledge and positive attitudes in order for desired behavioral changes to occur. In this context, PHBS education that provides knowledge as well as direct practice is in accordance with the principles of the theory, where behavioral changes not only occur due to information, but also through real experiences that motivate students to behave healthily.

Social Cognitive Theory, developed by Bandura in 2020, asserts that effective learning processes do not depend solely on verbal instruction or theory, but are strongly influenced by observation and imitation of the behavior of others in the environment. Through this process, individuals can learn new behaviors by looking at how models, such as teachers or peers, execute certain actions. In the context of PHBS education at SD Anduring Padang, this approach is very relevant because students can observe and imitate hygiene practices that are demonstrated directly.

In this study, PHBS education, which involves practical demonstrations-for example, how to wash hands properly and maintain environmental cleanliness—is complemented by strengthening behavior through regular monitoring by teachers and school officials. The Monitoring serves as a form of positive reinforcement that encourages students to continue to carry out clean living behaviors. By monitoring and rewarding positive behaviors, students feel supported and motivated to maintain those habits consistently.

This approach reinforces the theoretical basis that the social environment and interaction with others are instrumental in the formation and maintenance of behavior. A school environment that supports and provides concrete examples will make it easier for students to internalize the values of clean and healthy living. Thus, Social Cognitive Theory provides a strong conceptual framework for understanding how PHBS education involving observation, imitation, and reinforcement can be effective in shaping positive hygiene behavior in elementary school students.

This analysis also refers to research by Sari et al. (2024) which emphasizes the importance of sustainability in PHBS education and infrastructure support as key factors for successful behavior

change. The study shows that without adequate facilities, education alone is not enough to produce lasting change. This is in accordance with the conditions in SD Anduring Padang, where the success of education must be supported by facilities such as proper handwashing and toilets so that students can apply healthy behavior consistently.

Researchers also observed that PHBS education provides a positive psychological impact in the form of increasing awareness and responsibility of students to the cleanliness of the school environment. This is in line with the research of Wulan et al. (2023) who found a strong correlation between student awareness and the implementation of clean living behavior. The awareness that grows thanks to education encourages students to actively maintain cleanliness and play a role in creating a healthy and comfortable school environment.

In a more in-depth analysis, the education provided not only increases knowledge, but also motivates students through positive reinforcement and recognition from teachers and peers. This is important considering the theory of motivation Self-Determination Theory which states that intrinsic motivation is the main key in maintaining new behaviors. Effective education must be able to generate such motivation so that behavior change is not temporary.

Overall, the results of the bivariate analysis in this study confirmed that clean and healthy behavior education (PHBS) is an effective strategy in improving the hygiene behavior of students in SD Anduring Padang. Statistically significant and meaningful improvements indicate that well-planned and implemented educational programs are capable of producing positive changes in student behavior. These findings confirm the importance of educational interventions as an integral part of efforts to improve the quality of healthy life in the primary school environment.

Support for the effectiveness of PHBS education is also based on various theories of behavior change as well as current research that shows that an interactive and structured approach is crucial in forming sustainable healthy living habits. In addition, the success of this program is also greatly influenced by the availability of adequate facilities and infrastructure, such as hand washing facilities and proper sanitation. A clean and healthy school environment is an important foundation for optimal child development, both physically and psychologically.

Based on these findings, the researchers recommend that schools continue to continue and develop PHBS education programs on an ongoing basis. In addition, special attention should be paid to the provision and maintenance of support facilities so that students can consistently adopt clean living behaviors. The synergy between education and adequate facilities is expected to create a strong and sustainable hygiene culture in schools, thus supporting the overall health and learning achievement of students.

CONCLUSION

The results showed that clean and healthy behavior education (PHBS) is effective in improving the hygiene behavior of students in SD Anduring Padang. There was a significant increase in the percentage of students with good hygiene behavior, which shows that educational interventions are able to form positive clean living habits. These findings are supported by a variety of current research and theories that affirm the importance of an educative approach that involves hands-on practice and behavioral reinforcement.

Statistical tests corroborated the univariate findings by showing a significant increase in the average score of student hygiene behavior after PHBS education, which was statistically proven through the paired sample t-test. Education that is structured, interactive, and supported by adequate facilities is a key factor in the success of these behavior changes. Therefore, the implementation of sustainable

PHBS education programs and the provision of supporting facilities is very important to create a clean, healthy school environment, and support optimal student growth and development.

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