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IMPROVING ELEMENTARY STUDENTS' HYGIENE BEHAVIOR THROUGH CTPS EDUCATION AND FACILITIES PROVISION IN COASTAL AND URBAN SCHOOLS OF KENDARI, INDONESIA

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Abstract

Soil-transmitted helminth (STH) infections remain a significant health challenge in Indonesia, particularly among school-age children. This community service program aimed to increase students' knowledge and hygiene behavior through Clean and Healthy Living Behavior (PHBS) education, specifically handwashing with soap (CTPS), in two elementary schools: SDN 85 and SDN 94 Kendari. The intervention included interactive education sessions, CTPS demonstrations, educational materials distribution, and provision of portable handwashing stations. Pre-test and post-test assessments showed improved student knowledge and observed hygiene practices. The program's unique approach involved not only student-targeted education but also active coordination with school staff and facility enhancement. The results showed increased handwashing behavior, better awareness of hygiene, and positive feedback from both students and school personnel.

Keywords: CTPS, Elementary School, Hygiene Education, Handwashing, Sanitation, STH Prevention

INTRODUCTION

Soil-transmitted helminth (STH) infections are among the most widespread diseases globally, with an estimated 1.5 billion people or approximately 24% of the world's population infected (World Health Organization, 2023). These infections predominantly affect populations living in poverty with limited access to clean water, sanitation, and hygiene practices, especially in tropical and subtropical regions. The highest prevalence rates are recorded in Sub-Saharan Africa, China, South America, and Asia. In Indonesia, it is estimated that over 60% of the 220 million population is infected with intestinal worms, with around 24% of those affected being children (Anjarsari, 2018; Lee & Ryu, 2019). Elementary school-aged children are particularly vulnerable due to habits such as playing barefoot in soil, consuming unregulated street food, and a general lack of awareness regarding hand hygiene.

Nationally, helminth infections remain a concerning public health issue, largely due to poor sanitation and environmental hygiene. Children are especially susceptible due to their

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underdeveloped hygiene behaviors. In Southeast Sulawesi, data from the Provincial Health Office indicates a year-on-year increase in helminth infection cases: from 9% (8,784 cases) in 2019, to 10% (9,949 cases) in 2020, and rising again to 11% (11,275 cases) in 2021 (Dinas Kesehatan Provinsi Sulawesi Tenggara, 2022). A major contributing factor is the lack of consistent handwashing with soap (CTPS), which, despite being part of national hygiene campaigns, remains inadequately practiced in elementary school settings.

The primary issues observed at the partner schools SDN 85 Kendari and SDN 94 Kendari mirror the broader challenges in implementing Clean and Healthy Living Behaviors (PHBS) in school environments. SDN 94, located in a coastal area, faces significant infrastructure limitations, including the absence of adequate handwashing facilities and a general lack of clean behavior habits among students. Meanwhile, SDN 85, located in an urban area, has relatively better infrastructure but still struggles with poor hygiene practices, such as students purchasing unhygienic snacks and not washing hands after playing. These cases suggest that helminth infections are not solely linked to geographical settings but are also significantly influenced by daily habits and education. The problems identified involve not only infrastructure deficits but also insufficient knowledge and hygiene behaviors that fall below PHBS standards. Therefore, interventions must extend beyond one-way health education; they must incorporate participatory, demonstrative approaches supported by appropriate facilities.

Similar programs have been implemented using CTPS promotion strategies in elementary schools through lectures, games, chants, and handwashing demonstrations. However, previous studies have shown that these approaches are less effective when not accompanied by facility provision and institutional support. While there have been improvements in children's knowledge of CTPS following educational interventions using playful demonstrations (Caesar et al., 2024; Dian Rahayu et al., 2025; Fatmawati, 2023), behavioral changes have not been sustained due to the unavailability of soap and clean water on a regular basis. This highlights the importance of direct intervention, including education, monitoring, and the provision of handwashing infrastructure. The program we developed is distinct in that it not only delivers educational interventions to students but also actively engages school stakeholders to ensure program sustainability. Moreover, the provision of educational posters and portable handwashing stations serves as an essential component of the intervention, enabling students to directly apply healthy behaviors beyond theoretical understanding.

The primary goal of this activity was to enhance students' understanding and habits related to handwashing with soap as a preventive measure against helminth infections. By targeting two schools with differing geographic and infrastructural characteristics, the program also aimed to compare the effectiveness of hygiene education across these contexts. Fourth-grade students were selected as the target group, considering their developmental stage, which allows them to understand and apply the information provided. In addition to educational components, the program included the provision of physical facilities such as portable handwashing stations and posters as a medium-term support mechanism. It is expected that this initiative will serve as a replicable school-based model for helminth infection prevention. The program's contributions go beyond improving knowledge scores it also aims to foster a broader culture of cleanliness and healthy living in school environments.

IMPLEMENTATION METHOD

The activities were conducted in several stages:

1. Coordination and Assessment: Initial meetings were held with school principals and teachers at SDN 85 and SDN 94 Kendari to present the program, assess existing sanitation conditions, and determine student participation. It was discovered that both schools lacked functional handwashing stations and that students often ignored hygiene practices. Target participants were determined during this phase, focusing on 4th-grade students.

2. Interactive Education Sessions: On October 28 and 29, 2025, interactive education on the dangers of helminths and the importance of CTPS was conducted using PowerPoint slides and question-and-answer sessions. A total of 59 students participated (61% male, 39% female), mostly aged 9-10 years, and all from Grade IV.

3. CTPS Demonstration: Students watched a WHO-guided 6-step handwashing video and participated in hands-on demonstrations. Yells and hygiene-themed songs were used to reinforce learning. Students took turns leading the demonstrations, and those who performed well were rewarded.

4. Educational Materials Distribution: Leaflets about worm prevention and CTPS were given to students to take home, and posters outlining the six handwashing steps were provided to both schools (five posters per school) to be placed in high-visibility areas.

5. Provision of Handwashing Facilities: Each school received one portable handwashing station, soap, and support materials. Prior to this, schools lacked soap even where sinks were available.

6. Program Evaluation: Pre- and post-tests were administered to assess knowledge improvement. Statistical analysis using the Wilcoxon test was performed due to the non-parametric nature of the data. Results showed a significant increase in student understanding of CTPS.

RESULT AND DISCUSSION

The community service activities began with coordination and socialization meetings at SDN 85 and SDN 94 Kendari to map the sanitation conditions and student hygiene behaviors, as well as to ensure the schools' readiness to support the planned interventions. Interactive education on the dangers of helminth infections and the importance of personal hygiene was delivered on October 28–29, 2025, targeting 59 fourth-grade students, the majority of whom were 9–10 years old. The methods included material presentation, discussion, and educational games.

This was followed by a demonstration of the WHO-recommended six-step handwashing procedure through video screenings and hands-on practice, reinforced with chants and songs to enhance student retention. The activities continued with the distribution of leaflets, the placement of educational posters in strategic areas within the schools, and the provision of portable handwashing stations and soap to support CTPS (Handwashing with Soap) practices. The evaluation results are presented in Table 1 below.

Table 1. Evaluation of Anti-Helminth Education at SDN 85 and SDN 94 Kendari Based on Pre-Test and Post-Test Results

Data	Meam	Standard Deviation	P-Value	n
Pre-test	8,76	1,023	0,011	59
Post-Test	9,17	1,117		59

There was an increase in the average knowledge score, from 8.76 in the pre-test to 9.17 in the post-test. This suggests that the educational intervention, which utilized leaflets, videos, and demonstrations, effectively improved elementary students' knowledge of helminth infection prevention. According to the Wilcoxon test, the resulting *p*-value of 0.011 (< 0.05) indicates a statistically significant difference in knowledge before and after the intervention.

These findings align with previous studies that indicate the effectiveness of combining verbal, visual, and hands-on education to improve hygiene behavior (Fatmawati, 2023; Fradianto et al., 2022). The program also emphasized the importance of school engagement and the availability of physical facilities as key components in sustaining behavioral change. The educational activities utilized lectures and discussions to enhance students' understanding of helminth infections, including symptoms, impacts, and preventive measures. Audiovisual media, particularly videos demonstrating the six-step handwashing technique, were employed to improve knowledge retention. Evaluation results showed that video-based health education was more effective than lectures alone, consistent with previous studies that reported an increase in students' knowledge scores from 4.43 to 7.75 and improved attitudes toward worm prevention ($p < 0.05$). The use of visual and auditory elements in videos helped deliver health messages in a more engaging and memorable way, enabling children to better understand the consequences of poor hygiene and the importance of proper handwashing practices (Sahariyani et al., 2024).

The educational program also incorporated hands-on demonstrations of the WHO's six-step handwashing technique, which strengthened students' motor understanding and allowed them to experience the correct procedure directly—an approach proven more effective than theoretical instruction alone. Health education literature consistently shows that participatory methods such as practice, role-play, and demonstrations outperform passive methods. This aligns with findings by Hakim et al. (2023), who reported that elementary school children better comprehend health concepts through direct practice. Learning by doing enables students to internalize and reproduce healthy behaviors more easily, while interactive activities foster enthusiasm and active participation.

Similar outcomes were observed in a related community engagement program at SD Negeri Pegalongan, where a combination of lectures, audiovisual media, microscopic observation of helminth eggs, and WHO-standard handwashing practice increased students' average knowledge scores from 47.4 to 74.8, with 82.4% demonstrating improved understanding (Sari et al., 2022). These findings affirm that interactive, practice-based learning is an effective strategy for enhancing helminth prevention knowledge and hygiene behaviors among elementary school students.

A notable difference between the coastal and urban schools was the availability of hygiene infrastructure. SDN 85, as an urban school, had better baseline facilities. However, students from both schools displayed similar initial levels of hygiene knowledge and habits,

suggesting that educational interventions remain essential even in better-equipped environments. Overall, this initiative demonstrated that CTPS education can enhance not only knowledge but also behavioral changes when delivered in a fun, repetitive manner, and supported by appropriate physical and social environments.

CONCLUSION

The community service program implemented at SD Negeri 85 Kendari and SD Negeri 94 Kendari demonstrated that educational interventions delivered through lectures, demonstrations, chants, and the provision of physical facilities can significantly enhance students' understanding and practices related to handwashing with soap (CTPS). When health education is delivered in an engaging and participatory manner, it fosters the development of clean and healthy habits among elementary school-aged children.

The intervention successfully increased students' awareness of the importance of hand hygiene in preventing helminth infections. The program's success was largely attributed to the active support of teachers and school administrators, as well as the availability of adequate infrastructure. The differences observed between the coastal and urban schools also highlighted the need to tailor educational approaches to specific school contexts to ensure that interventions are both relevant and sustainable.

Recommendations:

1. Continuous mentoring and follow-up are necessary to ensure long-term behavioral change among students.
2. Schools should receive support in establishing permanent handwashing facilities to maintain hygiene practices over time.
3. It is highly recommended to expand this program to other schools, especially in areas with limited access to sanitation.
4. Future initiatives should involve multi-sectoral collaboration, including local health authorities such as the District Health Office and community health centers (Puskesmas), to enhance the reach and sustainability of similar interventions.

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