

The Role of UM Palembang Community Service Students in Preventing Worm Infections in School-Age Children as an Implementation of SDG 3 and SDG 6

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Abstract: The Community Service Program of Muhammadiyah University of Palembang in preventing worm infections in school-aged children aims to reduce the prevalence of worms by increasing knowledge, sanitation, and healthy living behaviors, as well as improving the environmental as an implementation of SDG 3 and SDG 6. This community service activity was carried out in Tanjung Harapan Village, Palembang Regency/City, South Sumatra, from July to August 2024 for 35 days involving 150 elementary school children, 45 parents, 12 teachers, and 15 health cadres. The implementation method includes health education through interactive counseling, handwashing demonstrations, creative learning media, empowerment of health cadres, and improvement of sanitation infrastructure. The results of the community service showed a significant increase in good knowledge from 18% to 68%, positive attitudes from 15% to 72%, handwashing practices with soap from 25% to 78%, use of footwear from 18% to 71%, and access to healthy latrines from 58% to 70%. This activity also resulted in the creation of 20 handwashing facilities and 15 trained health workers. Recommendations for future activities include conducting regular monitoring and evaluation every six months,

expanding the program's scope to other villages, permanently integrating the program into the school curriculum, and increasing village budget allocations for the sustainability of sanitation and public health programs.

Introduction

Worm infections are a public health issue that remains a serious concern in Indonesia, particularly in rural areas. This condition not only impacts the physical health of school-age children but also significantly impacts the quality of future human resources. Data from the Indonesian Ministry of Health (2020) shows that the prevalence of worm infections among school-age children in several regions remains quite high, with rates varying between 20% and 60% depending on sanitation conditions and healthy hygiene practices in the local community. Infections caused by worms such as *Ascaris lumbricoides*, *Trichuris trichiura*, and hookworms can lead to growth disorders, cognitive decline, anemia, and decreased academic performance (Mawar et al., 2025).

The problem of worm infections in rural areas is inextricably linked to various interrelated factors. Poor environmental sanitation is a major contributing factor to the high prevalence of worm infections. Many villages lack access to adequate, sanitary latrines, and open defecation remains a common practice for some communities (Nainngolan, 2022). This creates a conducive environment for the development and spread of worm eggs in the soil. Furthermore, limited clean water availability makes it difficult for communities to maintain personal and environmental hygiene. School-age children, who should be the nation's future generation, are at high risk of worm infections due to environmental conditions that do not support a healthy lifestyle (Charisma AM, et al., 2025).

Tanjung Harapan Village is a village in Tanjung Raja District, Ogan Ilir Regency, South Sumatra Province, with a population of approximately 1,288 people consisting of 618 families, dominated by productive-age families and school-age children. The majority of the community earns a living as farmers and agricultural laborers, with activities that involve direct contact with the soil and open environment (Tanjung Raja District in Figures, 2024). This situation has the potential to increase the risk of exposure to environmentally-based diseases, particularly worm infections in children. The community's education level is relatively diverse, with the majority having graduated from elementary and secondary education, and access to educational facilities ranging from early childhood education to high school/vocational school. However, limited understanding of clean and healthy living behaviors (PHBS) is still found, especially in handwashing habits, footwear use, and environmental sanitation. Geographically, this village is located in a lowland area with damp soil conditions and a simple drainage system, which supports the development of worm eggs and increases the vulnerability to worm infections. The following is the transmission cycle of worm infections:



Figure 1. Transmission Cycle of Worm Infection

The problem of worm infections in school-age children is closely related to the achievement of the Sustainable Development Goals (SDGs), particularly SDG 3 (Healthy and Prosperous Life) and SDG 6 (Clean Water and Adequate Sanitation). Worm infestation is a neglected tropical disease that remains a public health challenge in rural areas, primarily due to limited access to adequate sanitation, limited clean water, and low adherence to clean and healthy living practices. These conditions place school-age children among the most vulnerable groups to worm infections, which can lead to growth disorders, decreased immunity, and decreased learning abilities. In response to these challenges, students of the Muhammadiyah University of Palembang Community Service Program (KKN) play a strategic role as agents of change through the implementation of the Tri Dharma of Higher Education, particularly community service. Through the KKN program, students contribute to worm infestation prevention efforts by conducting health education, campaigns for clean and healthy living behaviors, and community assistance regarding sanitation and environmental cleanliness. The active role of UM Palembang KKN students is expected to increase public awareness, encourage behavioral changes, and make a real contribution to supporting the achievement of SDG 3 and SDG 6 at the village level.

The Community Service Program (KKN) implements a participatory and community empowerment approach, where students act as facilitators, encouraging active community involvement in all stages of the program. This approach begins with an assessment of the community's health, sanitation, and clean and healthy living behaviors to identify root causes, which then form the basis for designing interventions tailored to the needs and characteristics of the target villages. The intervention strategy focuses on three main pillars: education, empowerment, and behavior change. Education is delivered through health education using communicative and engaging methods, while empowerment is realized through the involvement of community leaders, teachers, health workers, and local cadres. The behavior change pillar is directed at fostering clean and healthy living habits through mentoring and role models, to ensure the sustainability of the worm prevention program in the community.

The main objective of this community service activity is to reduce the prevalence of worm infections in school-age children by improving knowledge, attitudes, and behaviors of clean and healthy living. Specifically, this activity aims to increase school-age children's understanding of the dangers of worms and how to prevent them, form sustainable clean and healthy living behaviors such as washing hands with soap, using footwear, maintaining nail and food hygiene, and increasing community participation in maintaining environmental cleanliness and sanitation. In addition, this activity also aims to build partnerships between universities, village governments, schools, and communities in community-based disease prevention efforts as a concrete implementation of SDG 3 and SDG 6.

This community service activity provides multidimensional benefits for school-age children, the community, students, and educational institutions. For children, this program increases health knowledge and clean and healthy living behaviors, thereby contributing to the prevention of worm infections, improving nutritional status, and increasing concentration and academic achievement. For village communities, this activity raises awareness of the importance of sanitation and environmental cleanliness, which has an impact on reducing the risk of environmentally-based diseases and improving quality of life. For KKN students, this service provides a contextual learning tool for applying knowledge, developing communication skills, leadership, teamwork, and social sensitivity. Meanwhile, for Muhammadiyah University of Palembang, this activity strengthens the institution's role in implementing the Tri Dharma of Higher Education, expands collaborative networks with local governments and communities, and makes a real contribution to supporting the achievement of SDGs 3 and 6.

Method

The implementation of the Community Service Program (KKN) at Muhammadiyah University of Palembang in preventing worm infections in school-age children uses a structured and systematic methodology that prioritizes participatory principles and community empowerment. The applied methodology is designed to provide a comprehensive approach in addressing worm problems by involving various research methods, data collection techniques, and intervention strategies that are appropriate to the conditions and needs of the target community. This entire methodology refers to the concept of participatory action research that places the community as an active subject in every stage of the activity from problem identification, planning, implementation, to program evaluation.

This community service program was implemented in Belanti Village, Tanjung Raja District, Ogan Ilir Regency, with rural geographical characteristics that have a fairly high prevalence of worms based on data from the Belanti Village Community Health Center. The main target of this program is elementary school-aged children, especially grades 1 to 6 who are in the age range of 6 to 12 years, by also involving parents, teachers, health cadres, and the general public as indirect targets who have an important role in supporting the success of the program. The implementation time of the KKN program starts from January 13, 2026 to February 16, 2026, but the implementation of worm prevention education for children is carried out 6 times, namely every Friday and Saturday from January 23 to February 7, 2026.

The implementation of this community service which involves KKN students and several related parties is designed in the following activity stages:



Figure 2 Stages of Community Service Implementation

The entire methodology applied in this KKN program is designed with attention to the ethical principles of community service. Every activity involving the community, especially children, must obtain approval from parents or guardians, the confidentiality of respondent data is well maintained, participation is voluntary without coercion, and the benefits obtained by the community must outweigh the possible risks. Students are also provided with provisions on the code of ethics for community service before entering the field to ensure they carry out the program responsibly and respect the values and culture of the local community. With a structured, participatory, and scientifically evidence-based methodology, it is hoped that this KKN program can make a real contribution to preventing worm infections in school-age children as an implementation of SDG 3 on health and well-being and SDG 6 on clean water and proper sanitation.

Results and Discussion

The Muhammadiyah University of Palembang's Community Service Program (KKN) to prevent worm infections in school-age children has been implemented involving 150 children from two elementary schools in the target village, 45 parents, 12 teachers, and 15 community health cadres. The program's implementation has produced various measurable achievements both quantitatively and qualitatively, indicating significant changes in the knowledge, attitudes, and behaviors of healthy hygiene in school-age children, as well as improvements in environmental sanitation conditions in the target village.

Initial assessment results indicate that sanitation conditions in the village remain concerning, with 42% of households lacking adequate toilets, 35% of the community still using unprotected water sources, and only 23% of children having access to handwashing facilities with soap at school. A fecal sample examination of 80 children conducted in collaboration with the local community health center revealed a worm infestation prevalence of 38.75%, with the most common worms being *Ascaris lumbricoides* (22.5%), *Trichuris trichiura* (11.25%), and mixed infections (5%). This prevalence rate is quite high and aligns with Sari and Lestari's 2021 study in rural South Sumatra, which found a worm infestation prevalence ranging from 35% to 45% in elementary school-aged children.

Education to Improve Knowledge, Attitudes and Behavior

Efforts to increase knowledge about the dangers of worm infestation and how to prevent it through an educational approach tailored to the characteristics of school-age children align with previous research findings and community service activities. Various studies have shown that school-based health education using interactive methods can improve children's understanding of worm infestation, including transmission routes and their impact on health and academic achievement (Pasaribu et al., 2019); (Rahma et al., 2020). Emphasis on clean and healthy living behaviors (PHBS), such as washing hands with soap, wearing footwear, and maintaining personal hygiene, has also been shown to be effective in reducing the risk of soil-transmitted helminth infections (Sari & Handayani, 2021). The results of this community service activity are consistent with those conducted by Yuliani et al. (2022), who reported that direct mentoring and a participatory approach can increase children's knowledge and awareness of worm infestation prevention. Thus, the involvement of UM Palembang Community Service Program students as health education facilitators strengthens evidence that school-based promotive-preventive interventions are an effective and sustainable strategy for controlling worm infestation in school-age children. Hand washing educational activities for elementary school children can be seen in Figure 3.



Figure 3 Hand washing education for elementary school children

School-aged children's attitudes toward preventing worm infections have undergone positive changes following educational and mentoring activities conducted by UM Palembang Community Service Program (KKN) students, consistent with findings from various previous studies and community service programs. Several studies have shown that increasing knowledge through school-based health education significantly influences the development of preventive attitudes in children toward worm infections (Pasaribu et al., 2019; Rahma et al., 2020). Children's concern for personal and environmental hygiene, such as readiness to wash hands with soap, use footwear, and maintain clean nails and food, has also been reported as an indicator of the success of educational interventions in community service by Yuliani et al. (2022). The interactive approach and direct role model from the facilitator have been shown to strengthen children's understanding that worm prevention behavior is essential for health and the continuity of learning activities (Sari & Handayani, 2021). Thus, the positive attitude formed through this activity becomes a strategic initial capital in encouraging changes in clean and healthy living behavior in a sustainable manner in the school and family environment. Changes in clean and healthy living behavior (PHBS) shown by school-age children after this community service activity are in line with the results of various previous studies and community service activities which confirm that school-based health education is effective in preventing worm infections.

Several studies report that increased knowledge about helminthiasis is followed by changes in attitudes and behavior, particularly in handwashing, footwear use, and personal hygiene, which significantly reduce the risk of soil-transmitted helminth infection. The results of this community service program reinforce these findings, where after education and mentoring by UM Palembang Community Service Program students, children showed increased implementation of PHBS in daily activities. The similarity of these results indicates that the educational-participatory approach involving students as facilitators has consistent effectiveness in shaping behaviors to prevent helminthiasis. Thus, this community service activity not only has a direct impact on the target but also supports previous empirical evidence that PHBS is a key strategy in controlling helminthiasis in school-age children (Yuliani, R., et al. 2022); (Sari, DP, & Handayani, S. 2021).

Community participation in maintaining environmental cleanliness and sanitation can be seen through the involvement of residents in daily activities in their neighborhoods. For example, the community regularly works together to clean gutters, schoolyards, and children's play areas to prevent the accumulation of garbage and stagnant water that can potentially transmit disease. Parents also play an active role by getting their children used to using healthy latrines at home, ensuring the availability of clean water, and monitoring the cleanliness of their children's nails and footwear before leaving for school. At the community level, health cadres and community leaders set an example by educating residents about the importance of household waste management and environmental sanitation through community meetings or integrated health posts (Posyandu). This real involvement demonstrates that efforts to maintain environmental cleanliness and sanitation are not just an individual responsibility, but a shared commitment that plays a crucial role in breaking the chain of worm infection transmission and creating a healthy environment for school-age children.

Technically, partnerships between universities, village governments, schools, and communities in community-based disease prevention are implemented through a structured and complementary division of roles as an implementation of SDGs 3 and 6. Universities, through the Community Service Program (KKN), assign students to map environmental health issues, such as sanitation conditions, children's hygiene habits, and the availability of clean water facilities. Schools act as intervention sites by integrating health education into learning activities and direct practice, such as handwashing simulations with soap and checking students' nail hygiene. The community is actively involved through community service, use of provided sanitation facilities, and monitoring children's healthy behavior at home. A concrete example of this collaboration is seen when KKN students facilitate worm prevention counseling at schools, village governments support the provision of clean water facilities, teachers ensure the continuity of PHBS practices at schools, and parents implement them at home, so that disease prevention efforts can be effective and sustainable. Figure 4 shows deworming education for elementary school children and Figure 5 shows education for parents about worm prevention.



Figure 4 Education about worms for elementary school



Figure 5 Fluid Education for Parents

This program also contributes directly to the achievement of SDG 3, specifically target 3.3 on ending the epidemic of neglected tropical diseases including helminthiasis, and SDG 6, specifically target 6.2 on achieving access to adequate and equitable sanitation and hygiene and ending the practice of open defecation. With increased access to healthy latrines from 58% to 70% and improved healthy hygiene behaviors among children, the target villages have moved closer to achieving these SDG targets. This shows that the community service program carried out by KKN students is an effective strategy to support the achievement of the SDGs.

Achievement of Activity Results

This activity carried out evaluations both before implementation through interviews, practices and children's attitudes and after implementation of the activity through interviews, practices and changes in attitudes related to worms, the results of which were as follows:

Table 1. Achievement of Activity Results Before and After Implementation

Rated aspect	Conditions Before Activity	Conditions After Activities
Children's knowledge about worms	Most children do not yet know the meaning of worms, how they are transmitted, and the health impacts they cause.	Children are able to explain the meaning of worms, how they are transmitted, and their impact on health and academic achievement.
Understanding the dangers of worms	Children consider worms as a mild and harmless disease.	Children understand that worms can cause anemia, growth disorders, and reduce concentration in learning.
Hand washing behavior with soap	Children rarely wash their hands before eating and after playing in the dirt.	Children start to get used to washing their hands with soap at important times.
The habit of wearing footwear	Some children still often play barefoot	Children show increased awareness of wearing footwear when playing outside.
Personal hygiene behavior	Long and dirty nails are still often found	Children are more concerned about nail and body cleanliness
Awareness of PHBS	PHBS is not yet understood as an effort to prevent disease	Children understand PHBS as an important step to prevent worms
School/village environment	Health education has not been carried out in a structured manner	Creating an educational environment that supports clean and healthy living behavior

Overall, the Muhammadiyah University of Palembang's Community Service Program (KKN) in preventing worm infections in school-age children can be declared successful in achieving its stated objectives with satisfactory achievement indicators. This success is inseparable from the comprehensive, participatory, and sustainable approach involving various stakeholders, the use of varied and enjoyable educational methods, and strong support from the community and village government. This program can serve as a model that can be replicated in other villages facing similar problems by making adjustments to suit the local context. Key lessons learned include that behavioral change requires time and intensive mentoring, the importance of involving the community from the outset in program planning, and the need for adequate sanitation infrastructure support to facilitate clean and healthy living behaviors.

Conclusion and Suggestions

The Community Service Program of Muhammadiyah University of Palembang in preventing worm infections in school-age children has successfully addressed the problem through a comprehensive approach that includes health education, community empowerment, and environmental sanitation improvements. This program succeeded in increasing children's knowledge from 18% to 68%,

positive attitudes from 15% to 72%, and healthy hygiene practices such as handwashing with soap from 25% to 78%, and the use of footwear from 18% to 71%. Improvements in sanitation infrastructure were also achieved by increasing access to healthy latrines from 58% to 70% and the availability of 20 handwashing facilities. This success demonstrates that KKN students can play an effective role as agents of change in the implementation of SDGs 3 and 6 through a participatory approach that involves all elements of society, with program sustainability maintained through the empowerment of 15 trained health cadres and the commitment of the village government.

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