

Evaluation of the deworming medication program for school-aged children in the working area of Puskesmas Simpang IV Sipin

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Abstract

Background: Neglected Tropical Diseases (NTDs) remain a public health concern in Indonesia. Several prioritized NTDs include filariasis, soil-transmitted helminthiasis (STH), schistosomiasis, leprosy, rabies, and yaws. STH infections are among the neglected tropical diseases posing significant public health problems, particularly in areas with poor sanitation and low health awareness. School-aged children (5-14 years) are especially vulnerable to worm infections including *Ascaris lumbricoides*, *Trichuris trichiura*, and *Ancylostoma duodenale* due to various adverse effects including anemia, malnutrition, stunted growth, and decreased concentration in learning. **Methods:** A comprehensive evaluation of the deworming program is conducted to determine its effectiveness, identify existing obstacles, and formulate more targeted improvement strategies. The evaluation is based on four building blocks: input, process, output and outcome, using a mixed descriptive approach with questionnaires for interviews and direct observation. **Results:** The program officer has an educational background in three-year Diploma of Midwifery with 15 years of work experience. Although not officially appointed, field activities are supported by personnel from Environmental Health, Health Promotion, and other Public Health divisions. There is no official technical guideline for implementation; information from the Health Office has only been communicated via WhatsApp messages. Instructional materials are clear, but school cooperation is essential in reminding students and parents to ensure medication is taken. **Conclusion:** The helminthiasis control program at Puskesmas Simpang IV Sipin has been fairly well-executed according to technical guideline criteria, though specific training should be provided to enhance program manager capacity and performance.

Keywords: Neglected disease; helminth; evaluation; program.

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INTRODUCTION

Neglected Tropical Diseases (NTDs) are a group of tropical diseases that are often overlooked. In Indonesia, several NTDs are prioritized, including filariasis, helminthiasis (worm infections), schistosomiasis, leprosy, rabies, and yaws. NTDs are diseases caused by various pathogens, including viruses, bacteria, protozoa, and parasitic worms [1]. Helminthiasis or intestinal worm infection is one of the neglected tropical diseases that remains a public health problem in Indonesia, particularly in areas with poor sanitation and low levels of personal hygiene. School-aged children (5–14 years old) are most at risk because they frequently come into contact with environments contaminated with worm eggs. Intestinal worm infections such as *Ascaris lumbricoides*, *Trichuris trichiura*, and *Ancylostoma duodenale* can cause various negative impacts on children, including anemia, malnutrition, impaired growth and development, and decreased learning concentration. These effects ultimately impact the quality of human resources in the future [2-3].

According to WHO data in 2023, more than 1.5 billion people, or 24% of the world's population including 260 million preschool-aged children and 654 million school-aged children are infected with Soil-Transmitted Helminths (STH). This neglected disease causes more than 500,000 deaths each year. It is most common in developing countries, where 70% of STH infections occur in Asia, particularly in Southeast Asia. Worms deplete the host's iron and protein by feeding on body tissues, including blood. For example, anemia can result from prolonged blood loss caused by hookworms in the intestines. Worms also interfere with proper nutrient absorption. In addition, some soil-transmitted worms cause loss of appetite, reducing nutrient intake and fitness levels. Roundworms, for instance, compete with the host for vitamin A in the intestines [3-6].

Based on data from the 2021 Indonesian Nutrition Status Survey (SSGI) by the Ministry of Health, the prevalence of helminth infection among children under five was 2.8%, with overall prevalence in Indonesia ranging from 2.5% to 62%, affecting all age groups between 40% and 60%. In some areas with poor sanitation, prevalence can reach up to 80%. About 60% of cases occur among children aged 5–14 years, and 21% affect elementary school children. In Jambi City in 2023, helminthiasis remained one of the highest-ranked environment-related diseases the fourth most common among other diseases particularly in the working area of Simpang IV Sipin Public Health Center (Puskesmas).

To address this issue, the Indonesian government through the Ministry of Health has implemented a Mass Drug Administration (MDA) program for deworming among elementary school children and their equivalents twice a year. This program aims to reduce the prevalence of worm infections and prevent their long-term impact on children's health. Although the program has been implemented nationally, it still faces several challenges, such as limited coverage in remote areas, resistance from some communities, and lack of regular monitoring and evaluation. Moreover, the success of this program depends not only on the distribution of medicine but also on changes in hygiene behavior and environmental sanitation improvements [4]. Therefore, a comprehensive evaluation of the deworming program is needed to determine its effectiveness, identify existing obstacles, and formulate more effective improvement strategies. This evaluation is also essential as a basis for policymakers in strengthening worm infection control programs in Indonesia, especially in Jambi City.

In this study, a problem-solving approach was used by evaluating aspects of input, process, output, and outcome to determine the program's effectiveness, identify barriers, and develop more appropriate improvement strategies. It also includes

exploring other neglected diseases such as leprosy, yaws, filariasis, and helminthiasis, followed by further specific development and long-term evaluation of the interventions carried out.

METHODS

Study design and setting

The evaluation was conducted based on four variables input, process, output, and outcome of the school-Age Children Deworming Program in the working area of Simpang IV Sipin Public Health Center, Jambi City. The assessment was carried out using a descriptive approach.

Population, samples and sampling

The subjects of the evaluation were program holders of neglected tropical disease control, specifically officers responsible for the deworming infection prevention program, implemented from June to October 2025.

Instruments and criteria

The evaluation tools included interviews using structured questionnaires and observations. These instruments contained variables to be measured, covering input, process, output, and outcome components.

Procedure and data collection

1. Input
 - a. Human resources – The program holders of neglected tropical disease control, specifically officers responsible for the deworming infection prevention program at Simpang IV Sipin Public Health Center, Jambi City. Evaluation included aspects such as education level, training attended related to neglected tropical infectious diseases, type and length of employment, and additional duties
 - b. Facilities – Availability of operational field vehicles (motorcycles/cars) and recording equipment.
 - c. Budget – Funds allocated for the operational activities of the deworming infection prevention program at Simpang IV Sipin Public Health Center, Jambi City.
2. Process
 - a. Planning – The process of developing work plans for the deworming infection prevention program at Simpang IV Sipin Public Health Center, Jambi City.
 - b. Implementation – All activities carried out by the officers in performing their duties as program holders of the deworming infection prevention program at Simpang IV Sipin Public Health Center, Jambi City
 - c. Supervision – The process of monitoring the implementation of the deworming infection prevention program at Simpang IV Sipin Public Health Center, Jambi City.
 - d. Evaluation – The assessment process of the program's implementation, including analysis of supervision and monitoring results.
 - e. Output
 - a) Case detection – The number of helminth infection cases identified and treated at health service facilities (auxiliary health centers and public health centers).

- b) Service coverage – The proportion of patients utilizing the health services divided by the predetermined service target.
- f. Outcome
The expected outcome of this program evaluation is a reduction in the incidence rate of helminth infections in the working area of Simpang IV Sipin Public Health Center, Jambi City.

Statistical analysis

Data obtained from interviews (via questionnaires) and observations were processed, compiled, and presented in tables and graphs. The results were then interpreted and analyzed descriptively.

RESULTS

The officer responsible for the deworming program at Simpang IV Sipin Public Health Center holds a Diploma III in Midwifery (D3 Midwifery) and has 15 years of work experience. Although only one person is officially in charge of the program, field activities are supported by other public health center staff from Environmental Health, Health Promotion, and other Community Health divisions. According to interviews, the officer has never received specialized training related to this program. Furthermore, there are no official technical guidelines for its implementation. Information from the Health Office is only communicated via WhatsApp messages; however, the instructions provided are clear and easy to understand. The coverage and target of the deworming program have reached 100%, but cooperation from schools remains essential to remind students and parents to ensure the medication is taken according to the correct dosage.

The program is implemented twice a year according to the national schedule, with Albendazole 400 mg being administered. Based on interview results and the program's target of 100% coverage, some schools have not yet carried out the program routinely due to delayed distribution of the medication. It was also noted that some children refused to take the medicine due to its unpleasant taste and concerns about side effects. Several challenges were identified in the field, including: delayed distribution of medication to certain schools, lack of coordination between schools and public health center staff, insufficient awareness-raising among parents regarding the importance of deworming, and some children experiencing mild side effects such as nausea and dizziness.

DISCUSSION

According to the World Health Organization (WHO), evaluation is a systematic way of learning from past experiences to improve the achievement, implementation, and planning of a program by carefully selecting various available options for subsequent application. Meanwhile, according to the American Public Health Association as cited in Soekidjo Notoatmodjo, evaluation is a process to determine the value or the level of success in achieving the objectives that have been set. In general, program evaluation can be divided into three types:

1. **Formative Evaluation**

This type of evaluation is conducted at the early stage of a program. The aim of formative evaluation is to ensure that the planned activities are truly aligned with the identified problems so that the program can effectively address them.

2. **Promotive Evaluation**

This evaluation is conducted while the program is being implemented. Its purpose is to measure whether the ongoing program aligns with the plan and to identify any deviations that may hinder the program's objectives.

3. **Summative Evaluation**

Summative evaluation is conducted after the program has been completed. Its main goals can generally be categorized into two: measuring the outputs and assessing the impacts produced by the program.

The scope of program evaluation can be divided into four groups:

1. **Evaluation of Inputs**

This involves assessing the utilization of various resources, including funds, personnel, and facilities.

2. **Evaluation of Process**

Process evaluation focuses on program implementation and whether it adheres to the pre-established plan. It includes all administrative stages, from planning, organizing, to program execution.

3. **Evaluation of Outputs**

Output evaluation assesses the results achieved and the implementation of a program.

4. **Evaluation of Outcomes**

Outcome evaluation examines the impact resulting from the program's implementation.

Regarding the process aspect, program implementation includes ownership of deworming management charts, recording of helminth infection diagnoses in inpatient/outpatient cards, and routine disease control reporting to the Health Office. Based on interviews with deworming officers, the absence of management charts at the health center was due to building renovations. During the relocation of materials, the previously available charts were lost, and their location became unknown. Additionally, officers reported that existing deworming management charts were placed in the IMCI (MTBS) clinic, and some charts at certain health centers were outdated and had not been updated. According to the officers, there has been no distribution of management charts allocated by the Jambi City Health Office to the health centers. For charts that are available, health center staff usually take the initiative to create them themselves [7-12].

Recording of the deworming program and routine reporting to the Health Office has been carried out by 100% of the health centers. Reports sent to the Health Office in the form of W2 documents are always submitted on time via WhatsApp. However, written reports are often delayed, and monthly summary reports are sometimes submitted past the designated date. Monitoring activities in the form of supervision by deworming officers from the Health Office over program implementation at health service units have been conducted. However, feedback on reporting results has not been provided by the health centers. According to interviews with officers, these supervision activities are incidental and there is no regular schedule for supervision.

CONCLUSIONS

The officer responsible for the deworming program at Simpang IV Sipin Public Health Center holds a Diploma III in Midwifery (D3 Midwifery) and has 15 years of work experience. Although only one person is officially in charge of the program, field

activities are supported by staff from the Environmental Health, Health Promotion, and other Community Health divisions. According to interviews, the officer has never received specialized training related to this program. Furthermore, there are no official technical guidelines for its implementation. Information from the Health Office is only communicated via WhatsApp messages; however, the instructions provided are clear and easy to understand. The coverage and target of the deworming program have reached 100%, but cooperation from schools remains essential to remind students and parents to ensure the medication is taken according to the correct dosage. Simpang IV Sipin Public Health Center to Improve coordination with schools to ensure the deworming schedule is implemented on time, Conduct routine monitoring and evaluation to maintain high program coverage and compliance among children in taking the medication. Provide educational materials that are engaging and easy for children to understand in order to increase their awareness of the importance of deworming prevention.

CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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DECLARATION OF ARTIFICIAL INTELLIGENCE USE

We hereby confirm that no artificial intelligence (AI) tools or methodologies were utilized at any stage of this study, including during data collection, analysis, visualization or manuscript preparation. All work presented in this study was conducted manually by the authors without the assistance of AI-based tools or systems.

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