

The Relationship Between Environmental Sanitation and Nutritional Status with Soil-Transmitted Helminths Infection in Elementary School Children

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Abstract: Poor environmental sanitation and malnutrition are the leading causes of STH infection. This studyaims to determine the relationship between ecological sanitation, nutritional status, and STH infection incidence in elementary school children. This type of research is descriptive research. The research location is UPT SDN 060831, Medan City. The sample was 32 respondent, Medan City students, obtained using the total sampling technique. Data was collected using questionnaire instruments, Body Mass Index (BMI) examinations, and fecal examinations. The data were further analyzed univariately. The results showed that most environmental sanitation conditions did not qualify, such as latrine conditions (68.8%), SPAL conditions (75.0%), trash can conditions (87.5%), and clean water facilities (68.8%). Nutritional status (BMI/U) was most in the normal category (65.6%), and no helminth eggs were found in respondents (negative STH), so a relationship analysis could not be carried out. It is suggested that the school and parents support government programs related to providing mass worm-prevention drugs.

Keywords: STH, Environmental Sanitation, Nutritional Status

INTRODUCTION

Health problems are complex problems in all countries and even the world that cannot beavoided and arise due to several factors. Many health problems appear almost every year. Oneof the health problems, such as Soil-Transmitted Helminths (STH), is a problem that often occurs in society and is considered normal by society. STH infection is an intestinal infection transmitted through soil media, in which worm larvae originating from the soil are then swallowed and hatched in the intestine, causing symptoms such as nausea, diarrhea, and abdominal pain. Four types of worms are usually transmitted to humans, namely roundworms (Ascaris lumbricoides), whipworms (Trichuris trichi-ura), hookworms (Ancylostoma duodenale and Necator americanus), and threadworms (Strong-yloides stercoralis). The main factor for STH infection is poor environmental sanitation (house sanitation, clean water sources, and trash bins that do not meet the requirements).

STH infection rarely causes death but can cause long-term health problems for sufferers, including declining health conditions, nutrition, intelligence, and productivity of sufferers, and economically causing many losses, thus reducing the quality of human resources, and can interfere with the absorption of food intake. Food in the digestive system can cause complications such as damage to the intestinal wall and anemia (Agustianingsih et al., 2020).

Based on data from the World Health Organization/UNICEF's Joint Monitoring Programfor Water Supply and Sanitation in 2023, Indonesia is ranked third globally with poor environmental sanitation. This is because around 109 million Indonesians need environmental sanitation that meets the requirements. Many Indonesians still defecate openly, so they are easily infected with STH (UNICEF, 2023).

Based on data from the World Health Organization (WHO) in 2023 states that there are more than 1.5 billion world population, or 24%, affected by STH infection where the infectionis the most widespread with a very high incidence rate, namely in tropical and subtropical regions such as sub-Saharan Africa, America, China, and East Asia. Most STH infections are at preschool age, with 267 million children and around 568 children living in STH-endemic areas requiring rare treatment and prevention (Silva et al., 2022).

Based on data from the Permenkes Number 15 Of 2023 Concerning Deworming. It states that the worm prevalence rate in Indonesia is still very high and varies between 2.5% - 62%— low economy and environmental sanitation factors that do not meet the requirements. The government made several efforts to prevent STH infection in 2023 by breaking the chain, including health promotion, giving mass drugs to elementary school children, handling sufferers, helminthiasis surveillance, and controlling risk factors. However, many Indonesiansstill suffer STH infections (Mascarini-Serra, 2011).

Based on data obtained from the North Sumatra Provincial Health Service in 2023, it is stated that North Sumatra Province has received worm medicine given to preschool and school children. Based on the results of interviews at UPT SDN 060831 on Thursday 27 January 2024, according to an officer survey, the majority of residents in the UPT SDN 060831 work area have the highest educational status, high school, with the most occupations being farmers and housewives. Then the environmental sanitation conditions in the UPT SDN 060831 work area are still inadequate, such as clean water facilities that do not meet the requirements, there are no trash bins available at home, and there is no waste water disposal channel (SPAL) that meets the requirements. condition. Then, it was discovered that environmental sanitation in schools still did not meet the requirements and students' personal hygiene was still poor; This makes it possible for these children to contract STH infections. In connection with research conducted by Ginting, 2019, regarding analysis of the determinants of worms in elementary school children in Janur Village, Karo Regency, it was stated that house sanitation and family income were related to the incidence of worms in elementary school children.

METHODS

The research location is UPT SDN 060831, Medan City. The time of the research was carried out from Thursday 27 January 2024. This type of research is an analytic observational study using a cross-sectional study design. The cross-sectional researchdesign is a study that studies the correlation between exposure or risk factors (independent) and effects or effects (dependent) by collecting data simultaneously at one time between risk factors and their effects, meaning that all variables, both independent and dependent variables, are observed at the same time (Irwan, 2021). The dependent variable in this study was the incidenceof Soil-Transmitted Helminths (STH) infection. The independent variables in this study were environmental sanitation (latrine conditions, SPAL, trash can conditions, and clean water sources) and nutritional status.

The population in this study were 32 students of UPT SDN 060831 Medan City, spread across 15 students in each class V. people, and class VI totaled 17 people. The sampling technique uses total sampling so that the number of samples is the same as the population, namely 32 people. The data in this study was collected using a questionnaire, and laboratory examinations were carried out to collect data related to worm infection status by looking for the presence or absence of worm eggs in the respondent's stool samples. Then the data was analyzed using univariate analysis using a frequency distribution table.

RESULTS AND DISCUSSION

Soil-transmitted helminth (STH) INCIDENT

Based on the results of research that has been done, the obtained distribution of studentsbased on STH events is as follows.

STH incident		Τα	otal	
		Ν	%	
Negative	32			100.0
Total	32			100.0

Table 1. Distribution Student Based on STH incident

Source: Primary Data, 2024

Based on Table 1, got is known that of 32 students Where all student negative STH infectionie as many as 32 people (100.0%).

SANITATION ENVIRONMENT

Distribution Respondents Based on Condition Toilet

Based on the results of research that has been done, then obtained distribution

respondentsbased on condition toilet as following.

Condition Toilet	Total		
	n	%	
Not Qualified	22	68.8	
Qualified	10	31.3	
Total	32	100.0	

Table 2. Distribution Respondents Based on Condition Toilet

Source: Primary Data, 2024

Based on Table 2, got is known that of the 32 respondents at most own condition latrines that do not fulfill the condition that is as many as 22 respondents (68.8%), and the least that is respondents with condition-fulfilling latrines condition as many as ten respondents (31.3%).

Distribution Respondents Based on Condition Channel Waste Water Disposal (SPAL)

Based on the results of research that has been done, then obtained distribution Respondentsbased on SPAL conditions as follows.

SPAL condition	Total		
	n	%	
Not Qualified	24	75.0	
Qualified	8	25.0	
Total	32	100.0	

Table 3.Distribution Respondents Based on SPAL condition

Source: Primary Data, 2024

Based on Table 3, got is known that of the 32 respondents, most have SPAL conditions which do not fulfill the condition that is as many as 24 respondents (75.0%), and the least that is respondents own SPAL conditions that meet conditions as many as eight respondents (25.0%).

Distribution Respondents Based on Condition Place Rubbish

Based on the results of research that has been done, then obtained distribution

Respondentsbased on the condition placed rubbish as follows.

Condition Place Rubbish	Total		
	Ν	%	
Not Qualified	28	87.5	
Qualified	4	12.5	
Total	32	100.0	

 Table 4. Distribution Respondents Based on Condition Place Garbage

Source: Primary Data, 2024

Based on Table 4, get is known that of the 32 respondents, the most conditioned Place trash that does not fulfill the condition that is as many as 28 respondents (87.5%) and the least that is respondents own condition place overflowing trash condition as many as four respondents (12.5%).

DISCUSSION

INCIDENCE OF STH INFECTION

Based on the research results, it is known that of the 32 students, all of them were negative for STH infection, there were 32 people (100.0%). Based on this data, the results of laboratory examinations carried out at the UPTD Public Health Laboratory of North Sumatra Province using the Easel method in microscope observations of 32 students in grades I-III of UPT SDN 060831 Medan City showed that they were not infected with STH worms. This could happen because based on the results of interviews with Telaga Biru Community Health Center officers, the students received deworming medication in the form of albendazole in February 2023. Deworming is a government program that is routinely implemented by the North Sumatra Provincial Health Service and UPT SDN. 060831 to prevent STH transmission in children, especially elementary school age.

This is in line with research by Rehgita (2023) based on USU Faculty of Medicine Parasitology laboratory tests with a sample size of 50 students in grades I-VI of SD Negeri 068005 Medan Tuntungan District; None of them were infected with STH worms (0.00%), this was because the school had received worm medicine from the local health center. This is also in line with Juliana's (2021) research, namely that based on the results of research in Gumantar Kwanyar Village on toddlers aged 2-5 years using microscopic examination with a sample of 20 respondents, 100% negative results were found, meaning that no STH eggs, larvae and worms were found.

ENVIRONMENT SANITATION LATRINE CONDITION

Based on the results, it was found that out of the 32 respondents the most had latrineconditions that did not meet the requirements, namely 22 respondents (68.8%), and the least, namely respondents who had latrine conditions that met the requirements, were ten respondents(31.3%). Based on the results of direct observation at the research location, it was found that mostof the respondents did not have private latrines, so they had to defecate in the river or a neighboring toilet, but this did not allow the child to get STH infection, as well as latrines at schools which were no longer used and had been it was so dirty that students had to defecate inpeople's homes close to the school.

SPAL CONDITION

Disposal of waste as a component of environmental sanitation can affect the incidence of helminthiasis because it can spread worm eggs into the environment. According to Sumanto (2010), Soil moisture is an essential factor in maintaining the development of worm eggs in thesoil. The SPAL requirements are to have a channel and flow smoothly, have a particular shelter, and be sanitary (the distance between the SPAL and the water source is at least 10 meters).

Based on the results, it was found that out of the 32 respondents, most had SPAL conditions that did not meet the requirements, namely 24 respondents (75.0%), and the least, namely respondents who had SPAL conditions that met the requirements, were eight respondents (25.0%). Based on these results, most respondents did not meet the requirements for SPAL conditions. This is by the results of direct observation at the research location that most people or respondents needed latrines that met the requirements, such as not having SPALand causing odor due to the disposal of residual wastewater indiscriminately placed.

This is supported by research by Sumanto (2010), who found exposure to hookworm eggs in the soil of as much as 77.8% of respondents who disposed of household liquid waste anywhere. At the same time, those flowing into the ditch should have only found 22.2% exposure. The same thing was also found in research by Nurhaedah (2006), which shows that there is a significant relationship between the provision of SPAL and the incidence of helminthiasis in Al-Akhyar elementary school students at Pondok Madinah Islamic Boarding School Sudiang Makassar. Improper waste disposal will have effects, such as becoming a disease carrier and damaging the plants around it. Therefore, wastewater must be appropriatelymanaged.

TRASH CONDITION

The effect of waste on the environment and health is no different from other pollutants. However, waste is not the cause (agent) of disease. However, it is a condition or medium for illness because waste is a medium for the growth and development of bacteria and parasites, and vectors for several diseases. Based on the results, it was found that out of the 32 respondents, most had trash bin conditions that did not meet the requirements, namely 28 respondents (87.5%), and the least, namely respondents who had trash bins that met the requirements, were four respondents (12.5%).

The results of observations in the field were that respondents generally disposed of garbage behind the house and even disposed of it in the garden and the river, while observations of the condition of the trash cans at SD 22 Tapaluluo did not meet the health requirements where garbage was still scattered everywhere. According to the local community, the waste that is usually disposed of in the house's backyard is treated by burning the waste. This is in line with research by Fitri et al (2012) showed no relationship between the conditions of the trash can and the incidence of helminthiasis.

CONDITION OF CLEAN WATER FACILITIES

Based on the results, it was found that out of the 32 respondents, most had clean water facilities that did not meet the requirements, namely 22 respondents (68.8%), and the least, namely respondents who had clean water conditions that met the requirements, were ten respondents (31.3%). The results of interviews and observations in the field show that the water source used by the community for their daily needs is a spring that has been tested for water quality by health workers later. However, many conditions for clean water still need to meet the requirements, such as no cover in a water storage container.

This is in line with research from Yusriati (2023), shows that the variables that do not affect worm infection are the use of cleanwater, use of latrines, availability of clean water, waste disposal facilities, and availability of latrines.

NUTRITIONAL STATUS (BMI/U)

Based on the results, it was found that out of the 32 respondents, most of them had normal nutritional status, namely 21 people (65.6%), then seven people (21.9%) had more nutritional status, and the least were obese, four people (12.5%). Based on these results, it can be concluded that most respondents have overweight status so that the child is not infected with STH; other factors include socioeconomic level, the mother's nutritional behavior, the

mother's knowledgeabout nutrition, and the child's eating pattern. This is in line with the research of Azizaturridhaet al., 2016 that the results of Fischer's Exact statistical test showed that there was no significant effect of worm infection on nutritional status based on BMI/U in children at SDN 2 Barabai Darat with a value of p = 1.000 (> 0.05).

CONCLUSION

The incidence of STH infection at UPT SDN 060831 Medan City based on laboratory results from 32 samples was declared negative or no positive cases of STH infection were found. Environmental sanitation conditions that do not meet the requirements can be seen from several indicators such as the condition of the toilet, namely 22 respondents (68.8%), the condition of the SPAL, namely 24 respondents (75.0%), the condition of the trash can, namely 28 respondents (87.5%). %) and clean water facilities for 22 respondents (68.8%). Most nutritional status (BMI/U). The category itself of normal nutrition was 21 people (65.6%). So it is necessary to maintain environmental sanitation at home and children's personal hygiene. Apart from that, schools must also support government programs related to providing mass deworming medicine and providing sanitation facilities such as providing hand washing facilities, rubbish dumps and proper toilets in schools.

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