IDENTIFICATION OF CACING SOIL TRANSMITTED HELMINTHES EGGS ON THE NAIL OF CLEANING OFFICER OF THE GORONTALO DISTRICT LIVING OFFICER

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ABSTRACT

Soil Transmitted Helminthes eggs are one type of worm eggs that can cause worm infections. Some of the factors that can affect it are nail hygiene and hand washing. Based on data from the Gorontalo Provincial Health Office in 2018, it shows that the prevalence of worms in Gorontalo District is around 8.7%.

The purpose of the study was to identify Soil Transmitted Helminthes eggs on the nails of the cleaning officers of the Gorontalo District Environmental Office. This research is quantitative descriptive with total sampling technique and sample size 47, with sedimentation inspection method using 0.9% NaCl solution. The data analysis technique used univariate analysis.

Based on the research that has been done, it was found 3 positive samples of worm eggs on the nails of the janitor and the frequency in this study was 6.4%. This is due to the lack of personal hygiene application, such as not routinely cutting nails once a week and not using personal protective equipment, namely gloves when working with direct contact with the soil and garbage, so it is hoped that cleaning staff will routinely cut nails once a week and use gloves when work and for the next researcher to check fecal matter on the cleaners of the Gororntalo Regency Environmental Agency.

Keywords: soil transmitted helminthes eggs, worm infection, sedimentation method.

INTRODUCTION

Worms infection caused by Soil Transmitted Helminth (STH) worms is still a public health problem that occurs in all continents of the world, both in tropical and sub-tropical areas. This is because the eggs and larvae of worms can thrive in warm, wet soil. Soil Transmitted Helminths (STH) infection is the leading cause of intestinal worms in the world. The types of STH that most commonly infect humans are Ascaris lumbricoides (roundworm), Trichuris trichiura (whipworm), and hookworm (hookworm) [1].

Indonesia as a country with a tropical climate is one of the factors that influence the worm infection rate. The incidence of worms in Indonesia is still high, ranging from 45-46%, while in certain areas with poor sanitation the incidence of worms can reach 80% [2].

The prevalence of worm infection in Indonesia is around 28.12%. The prevalence of worm infection increased to 62% [3]. This figure shows an increase within 2 years reaching 33.88% [4].

Gorontalo Province is an area with a tropical climate so that it facilitates the growth of worm eggs that cause infection

in humans. The prevalence of worms in Gorontalo District is around 8.7% [5].

Worms infection is still classified as a Neglected disease infection, which is an infection that is of little concern because this infection is chronic and does not cause clear clinical symptoms and the impact of this worm infection only appears and is visible for a long time or in the long term when STH worms begin to eat away at the human intestine. 6]. Worms in the human stomach tract absorb 2.8 grams of carbohydrates, 0.7 grams of protein daily and about 0.005–0.2 mL of blood depending on the type of worms [7].

The high prevalence of worm infections in Indonesia is caused by people who do not pay attention to personal hygiene, such as washing their hands properly before eating and after activities, maintaining clean nails and body and using footwear when outside the room. Nail hygiene and washing hands before eating are variables that play an important role in the occurrence of worm infection. The presence of dirt attached to the tip of the nail that is not cleaned, allows it to contain worm eggs that can enter the body through the mouth which is swallowed with the food eaten. This can cause a person to become infected with worms [8].

In addition to personal hygiene that has not been implemented, poor environmental sanitation can increase the prevalence of worm infections in an area such as unavailability of latrines (WC), defecating behavior in rivers and on the ground which can worsen environmental sanitation conditions supported by climate and temperature conditions in Indonesia. suitable for the life cycle of these intestinal nematodes which can survive in moist soil.

The behavior of people who often defecate in the river allows the worm eggs in the feces to spread along with the river water so that people who use the river water for their needs as drinking, cooking and bathing water will be more easily infected with worms In addition, the behavior of people who often defecate on the ground also makes it easier for worm eggs in the feces to reproduce well because STH worm eggs require soil to be infective and as a transmission medium so that people who use the land for plantations grow food such as vegetables. contaminated by worm eggs and if the processing process is not cooked properly, the worm eggs will enter the digestive tract.

The existence of a worm infection in a person has a quite serious impact, namely anemia caused by a lack of blood in the body and a lack of nutrients, both calories and carbohydrates. Children who have worms will have an effect on their growth and development power, a decrease in the quality of intelligence and cognitive impairments. Meanwhile, adults experience a decrease in work productivity and a decrease in the immune system so that they are easily infected with other diseases [9].

Garbage collectors are workers who have a lot of direct contact with soil and garbage. Garbage is the result of daily processing from human activities, piles of garbage, especially organic waste that wet the soil, will accelerate the process of decomposing waste into humus. This condition can cause the soil to become more hollow and have sufficient moisture to support the development of worm eggs in the soil [10].

Based on previous research, it was stated that from the results of examining nail feces cleaning officers who carried garbage found 5 positive samples of STH worm eggs from 30 samples examined or about 16.67% were infected with worm eggs [11]. This study confirmed that the incidence of worms in cleaners was caused by a lack of knowledge. This can be seen from the results of his research,

the proportion of respondents who had good knowledge was 27 respondents (60.0%), only 1 respondent (16.7%) who experienced worms positive and 26 respondents (66.7%) had negative results.

Meanwhile, the proportion of respondents with low knowledge, 5 respondents (83.3%) positively experiencing worms and negative 13 respondents (33.3%) [9].

Based on information from one person who works at the Gorontalo District Environmental Agency and field observations of garbage pickers at the Environmental Office in Gorontalo District, he still does not pay attention to occupational safety and health. Many of them have not used Personal Protective Equipment (PPE), such as not wearing masks, because they already think that they are comfortable with the smell of the garbage pile besides that the officers do not use gloves when doing activities that are in direct contact with the ground, which without realizing many diseases which is easy to infect one of which allows a person to be infected with worm eggs when not applying K3.

Based on the theory and explanation above, the researcher is interested in conducting research on "Identification of Soil Transmitted Helminthes eggs on the nails of cleaners of the Gorontalo District Environmental Office".

RESEARCH METHODS

This research is a type of quantitative research using a descriptive research design, which describes the types of Soil Transmitted Helminthes eggs on the nails of the Cleaning Officer of the Gorontalo District Environmental Office. This research was conducted from 02 October - 09 October 2020, the sampling location was at the Gorontalo District Environmental Office and for the location of the sample examination was carried out by the SMK Teknologi Muhammadiyah Limboto Laboratory sample pot, centrifuge, nail clippers, slide, cover glass, dropper, microscope, reaction tube, nail samples from cleaners and 0.9% NaCl (Physiological NaCl).Sampling using total sampling technique with a total sample of 47 nail samples cleaners of the Environmental Office of Gorontalo District. Data were analyzed using univariate analysis and processed with Statistical Package for Social Science (SPSS).

RESEARCH RESULT

Based on research that has been carried out on nail samples of cleaners of the Gorontalo District Environmental Office, 3 positive samples of worm eggs were obtained from 47 samples as shown in table 1.

Table 1.
The results of the examination of Soil Transmitted Helminthes worms on the nails of the cleaners of the Gorontalo District Environmental Office

Examination of STH worm eggs		
Result	**Frequency**	**Percentage (%)**
Negative	44	93.6
Positive	3	6.4
Total	47	100

Source: Data Processed (2020)

Based on table 1. Frequency distribution of nail sample examinations to cleaners at the Gorontalo District Environmental Office, the sample frequency that was not found worm eggs (negative) was 44 samples (93.6%), while the sample frequency found worm eggs (Positive) was 3 nail samples , so that the frequency in this study is 6.4%.

Table 2.
The frequency distribution of respondents is based on routine nail cutting once a week.

Cut nails regularly

Variable	Frequency	Percentage (%)
Cutting nails	13	27.7
Don't cut nails	34	72.3
Total	47	100

Source: Data Processed (2020)

Based on table 2. The frequency distribution of respondents who routinely cut nails in a week was 13 respondents (27.7%). Meanwhile, the frequency of respondents who did not routinely cut their nails in a week was 34 respondents (72.3%). This shows that respondents who do not regularly cut their nails once a week are more than the number of respondents who routinely cut their nails once a week.

Table 3.
Frequency distribution of respondents based on washing hands before eating.

Wash your hands before eating		
Variable	**Frequency**	**Percentage (%)**
Washing hands	30	63.8
Don't wash your hands	17	36.2
Total	47	100

Source: Data Processed (2020)

Based on table 3. The frequency distribution of respondents who wash their hands before eating is 30 respondents (63.8%). Meanwhile, the frequency of respondents who did not wash their hands before eating was 17 respondents (36.2%). This shows that there are more respondents who wash their hands before eating than the number of respondents who do not wash their hands before eating.

Table 4.
Frequency distribution of respondents based on washing hands using soap.

Wash your hands with soap		
Variable	**Frequency**	**Percentage (%)**
Using soap	30	63.8
Don't use soap	17	36.2
Total	47	100

Based on table 4. The frequency distribution of respondents who wash their hands using soap is 30 respondents (63.8%). Meanwhile, the frequency of respondents who do not wash their hands using soap is 17 respondents (36.2%). This shows that respondents who wash their hands using soap are more than the number of respondents who wash their hands without using soap.

Table 5.
Frequency distribution of respondents based on eating using a spoon.

Eat using a spoon		
Variable	**Frequency**	**Percentage (%)**
Using a spoon	42	89.4
Don't use a spoon	5	10.6
Total	47	100

Source: Data Processed (2020)

Based on table 5. The frequency distribution of respondents who use a spoon when eating is 42 respondents (89.4%). Meanwhile, the frequency of respondents who did not use a spoon when eating (directly using their hands) was 5 respondents (10.6%). This shows that respondents who eat using a spoon when eating are more than the number of respondents who do not use a spoon when eating.

Table 6.
The frequency distribution of respondents is based on wearing gloves while working.

Use of gloves while working		
Variable	**Frequency**	**Percentage (%)**
Put on gloves	8	17.0
Don't wear gloves	39	83.0
Total	47	100

Source: Data Processed (2020)

Based on table 6. The frequency distribution of respondents who use gloves while working is 8 respondents (17.0%). Meanwhile, the frequency of respondents who did not use gloves while working was 39 respondents (83.0%). This shows that the respondents who did not wear gloves while working were more than the number of respondents who wore gloves while working.

Table 7.
Frequency distribution of respondents based on eating using a spoon.

Obtaining PPE from Gorontalo District BLH		
Variable	**Frequency**	**Percentage (%)**
Get PPE	47	100
Didn't get PPE	0	0
Total	47	100

Source: Data Processed (2020)

Based on table 7.Frequency distribution of respondents who received personal protective equipment from the Gorontalo District Environmental Agency, namely all respondents were 47 respondents (100%). This shows that there are no respondents who do not get PPE from the Gorontalo District Environmental Agency.

DISCUSSION

Nail hygiene and hand washing are the main variables in the occurrence of worm infection [8]. This worm infection occurs due to the entry of worm eggs through the mouth that stick to the nails and skin of the human hands when eating without using a spoon. Apart from mouth, this worm infection can occur when the larvae penetrate the skin of the injured leg or hand and follow the bloodstream and then live and reproduce in the human intestine.

Based on table 1. The results of examination of Soil Transmitted Helminthes eggs on the nails of the cleaning officer of the Gorontalo District Environmental Office using the sedimentation method with 0.9% NaCl solution found 3 positive samples infected with Soil Transmitted Helmimthes worm eggs from 47 samples examined. Thus, the frequency of positive samples infected with worm eggs in this study was 6.4%. Contamination of the cleaning staff's nails by worm eggs is caused by personal hygiene factors, use of PPE and environmental factors. This is supported by observations made by researchers directly on cleaning workers who when working do not use PPE completely and the results of the answers to the questionnaire from the officers themselves. The types of worm eggs found in the cleaner's nail samples are Ascaris lumbricoides worm eggs. mature, immature Ascaris lumbricoides worm eggs and Enterobius vermicularis worm eggs.

With the discovery of Ascaris lumbricoides worm eggs, it is stated that, in Indonesia, Ascaris lumbricoides worms are endemic in various regions with an incidence rate of around 20 - 90%. Therefore, Ascariasis is a worm disease that has the greatest prevalence, when compared to other worm diseases [12].

The discovery of Ascaris lumbricoides eggs on dirty nails was caused because the eggs of Ascaris lumbricoides worms contained a thick hyaline layer and an albuminoid layer which served to protect the contents of the eggs, so that the eggs could last a long time on long and dirty nails. Furthermore, a fertile egg will become infective after 18 days to several weeks (depending on humidity, climate, and soil conditions) [13].

Mild infections caused by adult worms Ascaris lumbricoides, which can cause nausea, diarrhea, and decreased appetite. In more severe infections it can cause malabsorption leading to malnutrition [14].

*Ascaris lumbricoides*can infect workers who manage waste by ingesting worm eggs that are attached to the hands due to not wearing protective equipment such as gloves. Meanwhile, Enterobius vermicularis worms can infect waste transporters through contaminated food because garbage collectors do not use gloves and through inhalation of air.

The results of this study are in line with previous studies that found 2 positive samples were infected with worm eggs from 10 samples of nails examined, one of which was Ascaris lumbricoides worm eggs [15]. The results of this study were reinforced by research conducted by Herdiyana (2014), which found 5 samples (16.67) of nails positively infected with Ascaris lumbricoides eggs from 30 samples examined [11].

This study is not in line with previous research which states that there is no significant relationship between environmental sanitation and personal hygiene (hand washing habits, nail hygiene, and use of footwear) and infection with Soil Transmitted Helminths (STH) [16].

Routine Nail Cutting

Nail hygiene is a major variable in preventing the occurrence of worm infestation. It is important to cut nails to prevent the possibility of entry of soil containing worm eggs which is a place to live or a source of transmission of STH worm eggs. If the nails are left long and dirty when they are in contact with the soil, the soil which may contain a lot of worm eggs will more easily enter the body.

Based on table 2. The frequency distribution of cleaning workers who routinely cut nails in a week shows that the frequency of respondents who routinely cut nails was only around 13 respondents (27.3%). While the frequency of respondents who did not routinely cut their nails in a week was 34 respondents (72.3%). These results indicate that more respondents do not routinely cut their nails than respondents who routinely cut nails and pay attention to nail hygiene at least once a week.

This study is in line with previous research that all respondents in this study did not routinely cut nails and found 2 positive samples infected with worm eggs from the number of samples examined, namely 10 samples [15].

Washing hands

Hands are organs that we often use in various activities, for example working, cooking, taking food as well as a medium for entering these foods. Hand washing is a mechanical process to remove dirt and debris from the skin of the hands with the aim of breaking the chain of disease transmission from disease-causing microorganisms [17].

Washing your hands using soap is an absolute prerequisite to avoid various diseases. According to UNICEF, washing hands using soap containing antiseptic and clean water can reduce diarrhea and worm infections caused by parasites, reduce the transmission of ARI by more than 30%

and reduce 50% incidence of Avian Influenza. Having the habit of washing hands with water and soap can affect the spread of worm eggs and prevent worm infections so that worm eggs can enter the body. Washing hands without using soap allows the dirt containing worm eggs to stick to the hands and the eggs that stick to the hands are swallowed or through food that has been touched by dirty hands into the body [17].

Based on Table 3, the frequency distribution of respondents' habits in washing their hands before eating shows that the frequency of respondents who wash their hands before eating is 30 respondents (63.8%). while the number of respondents who did not wash their hands before eating was around 17 respondents (36.2%).

Based on table 4. The frequency distribution of cleaners who wash their hands using soap shows that the frequency of respondents who wash their hands using soap is 30 respondents (63.8%), while the frequency of respondents who wash their hands without using soap is 17 respondents (36.2%).

Based on Table 5. The frequency distribution regarding the habit of using a spoon when eating shows the frequency of respondents who use a spoon when eating is 42 respondents (89.4%). Meanwhile, the frequency of respondents who did not use a spoon when they ate, such as directly using their hands was 5 respondents (10.6%).

This research is in line with the previous research which states that of 45 respondents are divided into 2 categories, namely the category of respondents who wash their hands fulfilling the requirements of 28 respondents (62.2%) and the category of respondents who wash their hands do not meet the requirements of 17 respondents (37.8%). In the category of respondents who washed their hands fulfilling the requirements, 1 sample (16.7%) was infected with worm eggs and the category of respondents who washed their hands did not meet the requirements found 5 samples (83.3%) who were positively infected with worm eggs [18].

Personal Protective Equipment (Gloves)

The use of personal protective equipment is a good means to break the chain of worm infection transmission which requires soil to be infective and as a transmission medium. This personal protective equipment is routinely used considering that the majority of garbage pickers work daily in direct contact with soil and garbage. both organic and inorganic waste. Incomplete use of PPE facilitates the entry of worm eggs through various organs of the body such as the hands, feet and mouth [19]. Based on table 6. The frequency distribution regarding the habit of using gloves at work shows that the frequency of respondents using gloves is only 8 respondents (17.0%). While the frequency of respondents who did not use PPE while working was 39 respondents (83.0%).

This study is in line with previous studies which stated that there were 31 samples infected with worm eggs from 59 samples examined [19].

This research is reinforced by previous research that the results showed that out of 47 respondents, 5 positive samples of worm eggs were found from respondents who did not use PPE and 1 positive sample from respondents who used PPE. This shows that the proportion of waste transport officers who use PPE incompletely infected with worm eggs is greater than the proportion of garbage workers who use PPE in full [9].

Based on Table 7. The frequency distribution of BLH's attention in providing PPE to cleaners at the Gorontalo District Environmental Office is seen from the frequency test that the government provides and provides PPE to cleaning officers. However, the discovery

of worm eggs in the nail samples from the garbage picker cleaners was supported by the concern of the garbage collectors themselves in the use of PPE, the application of personal hygiene and the long period of time the government provided PPE so that the PPE was not suitable for use considering that every day the officer cleanliness works even on holidays.

In this study, it was found that non-STH worm eggs or worm eggs that did not require soil as a medium of transmission were eggs of Enterobius vermicularis. The discovery of Enterobius vermicularis eggs was also caused by personal hygiene factors and the use of PPE. This study is in line with previous research which stated that 18 positive samples were found to be infected with Enterobius vermicularis eggs from 28 respondents based on the category of respondents who had bad habits of cutting nails and maintaining nail hygiene. Whereas in the category of respondents who have good habits in cutting nails and maintaining nail hygiene, it was found that 2 samples were positively infected with worm eggs from 10 respondents who were examined [20].

The habit of washing hands before eating and washing hands after defecating using soap can also be a trigger for the finding of Enterobius vermicularis worm eggs, as in previous studies said that respondents who had bad habits in washing hands before eating found 18 positive worm eggs from 25 respondents, and also found 2 positive samples of worm eggs from 13 samples were examined based on the category of respondents who had good habits in washing their hands before eating using soap.Whereas in the category of respondents who have bad habits in washing their hands after defecating, there were 18 positive samples of worm eggs from 23 respondents and based on the category of respondents who had good habits in washing hands after defecating, 2 positive samples of worm eggs were found from 15 respondents. [20].

Enterobius vermicularis worms can spread through the hands of people with enterobiasis. If this enterobiasis sufferer has a bad habit of washing hands after defecation, the worm eggs will more easily stick to the hands and can easily move the food consumed. Coupled with the bad habit of washing hands before eating, it makes it easier for these worm eggs to enter the body.

Based on the theory that has been described as well as the results of the research that has been carried out in line with previous studies. Where from a total of 47 nail samples examined, 3 nail samples were positively infected with Soil Transmitted Helminthes eggs. Positive results were found in respondents who did not pay attention to the importance of applying personal hygiene in their daily life, especially when working where conditions would be in direct contact with the ground. In addition, the use of incomplete personal protective equipment (PPE) can be a major factor in the spread of worm eggs because respondents make direct contact with the soil and also garbage.

CONCLUSION

Based on the research that has been done on "Identification of Soil Transmitted Helminthes eggs on the nails of the cleaners of the Gorontalo District Environmental Agency", it can be concluded:

1. The results of identification of worm eggs on the nails of the Environmental Office cleaning staff found 3 nail samples infected with worm eggs. So that the frequency in this study is 6.4%. The types of worm eggs found in this study were mature Ascaris lumbricoides eggs, immature Ascaris lumbricoides worm eggs and Enterobius vermicularis eggs.

2. The description of the risk factors for finding Soil Transmitted Helminthes eggs on the nails of the cleaners of the Gorontalo District Environmental Office is caused by personal hygiene factors such as routine nail cutting, washing hands before eating using soap and the use of personal protective equipment, namely gloves.

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