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Identification of Soil-Transmitted Helminth Eggs on The Nails of Cleaning Workers At TPS Wonocolo District, Surabaya City

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ABSTRACT

Background & Objective: In Indonesia, worm infections are still a big problem in public health because the prevalence is still high, namely 45-65%. even in certain areas that have poor environmental sanitation, high heat, and humidity, the prevalence of worm infections can reach 80%. Worm infections can cause a decline in the health condition, nutrition, and productivity of sufferers, resulting in economic losses, due to a decrease in carbohydrates, protein, and blood, which has an impact on reducing the quality of human resources, one of which is transmission through the nails. This study aims to determine whether or not there are Soil Transmitted Helminth (STH) worm eggs in the nails of cleaning workers in Wonocolo District, Surabaya City.
Method: The research method used was deposition (sedimentation) centrifugation using 0.25% NaOH solution, which was analyzed descriptively. The sampling technique used was purposive sampling by taking nail samples from 30 waste cleaning officer respondents.
Result: The results of the research showed that 17% of the fingernails of waste cleaners were contaminated with Soil Transmitted Helminth (STH) worm eggs, while 83% of nail samples that were not contaminated with Soil Transmitted Helminth (STH) worm eggs were contaminated.
Conclusion: Based on the research results, it can be concluded that there are still cleaning workers in Wonocolo District, Surabaya City, who are contaminated with Soil Transmitted Helminth (STH) worm eggs. This happens because their awareness about personal hygiene, sanitation, Clean and Healthy Living Behavior (CHLS), and the use of Personal Protective Equipment (PPE) while working is still lacking.

Keywords: Nails, Cleaning staff, Soil Transmitted Helminth

INTRODUCTION

Soil Transmitted Helminth (STH) or also known as worm disease, is a group of parasitic worms (class Nematoda) that can cause infection in humans through contact with eggs or larvae of the parasite itself, which develop in moist soil found in tropical and subtropical countries. This group of parasitic worms includes *Ascaris lumbricoides,* which causes ascariasis, *Trichuris trichiura* causes trichuriasis, hookworm (there are two species, namely *Necator americanus* causes necatoriasis, *Ancylostoma duodenale* causes ancylostomiasis), and *Strongyloides* stercoralis causes strongyloidiasis (Gea, 2022).

Worm infections can cause a decline in health, nutrition and productivity in sufferers, resulting in economic losses, due to decreased carbohydrates, protein, and blood which have an impact on the quality of human resources. Worm infections not only occur in rural areas but also in urban areas with a high prevalence of cases also having a major impact on human resources. Even so, public attention to worms is still too small to be considered a problem that does not need to be considered (Dumatubun, 2022).

Based on data from the World Health Organization (WHO) in 2012, it was explained that more than 1.5 billion people, or 24% of the world's population, were infected with Soil Transmitted Helminth (STH), and 60% of them were children. Infection is widespread in tropical and subtropical areas, with the largest incidence in Sub-Saharan Africa, America, China, and East Asia (WHO, 2012). In Indonesia, worm infections are still a major problem in public health because the prevalence is still high, which is approximately 45%-65%. Even in certain areas that have poor environmental sanitation, high heat, and humidity, the prevalence of worm infections can reach 80%. The most infections are caused by intestinal nematodes with transmission through the soil or Soil Transmitted Helminth (STH) in the first place, namely *Ascaris lumbricoides* of 1.2 billion, *Trichuris trichiura* of 795 million, and *Hookworm* of 740 million (Awaliyah, 2020).

Transmission of Soil Transmitted Helminth (STH) begins with the habit of defecating carelessly, which causes the soil to be contaminated with worm eggs. Then the worm eggs survive in moist soil and develop into infective eggs. Infective eggs found in the soil can infect humans if the worm larvae penetrate the skin or are indirectly swallowed the worm eggs (Permenkes RI, 2017). The spread of Soil Transmitted Helminth (STH) infection is also influenced by several factors, one of which is poor personal hygiene (Jesika, 2020).

One of the jobs that is at risk of being infected with Soil Transmitted Helminth (STH) eggs is a garbage collector. Garbage collectors are a group of workers who are more often in contact with garbage and are more often in dirty environments (Nasrul et al., 2020). Many of them do not use personal protective equipment. This can happen because the level of cleanliness of garbage collectors is still not good. The diseases caused have become a health problem community. The habit of cleaners who sometimes do not wear personal protective equipment, such as gloves, when sorting waste can cause worm infections. With transmission through fingernails that do not use Personal Protective Equipment (PPE) when sorting waste, and leaving nails dirty and long so that they are more easily infected with Soil Transmitted Helminth (STH) eggs (Nofiyanti, 2021).

OBJECTIVE

Because from a direct survey at the Temporary Disposal Site not all officers use complete Personal Protective Equipment (PPE) and there is minimal research on worm infections in the nails of cleaners in Surabaya, the researcher is interested in examining the presence or absence of Soil Transmitted Helminth (STH) worm eggs on the nails of cleaning workers at the TPS Wonocolo District Surabaya City.

METHOD

This research uses a descriptive method. The population of this study is 30 cleaners at the TPS in Wonocolo District. The sampling technique used is the Purposive sampling technique. The examination method uses the sedimentation method. Data analysis techniques are presented as tables and pie charts. Using the percentage (%) with the formula:

$$P = \frac{F}{N} \times 100\%$$

Caption;
P = Percentage
F = Responden Frequency
N = Total Sample

RESULTS

The results of the examination of Soil Transmitted Helminth Eggs in the nails of janitors were 5 infected nail samples and 25 nail samples that were not infected with Soil Transmitted Helminth Eggs. Data on the results of identification of Soil Egg Transmitted Helminth in the nails of janitors at the Wonocolo TPS in Surabaya City have been tabulated in tabular form, then presented using percentage numbers (%) using the formula:

$$\frac{5\ infected\ sample}{total\ sampling} \times 100\%$$

$$\frac{25\ not\ infected\ sample}{total\ sampling} \times 100\%$$

TABLE 1. Percentage of Soil Transmitted Helminth eggs contamination

Information	N	%
Positive	5	17%
Negative	25	83%
Total	30	100%

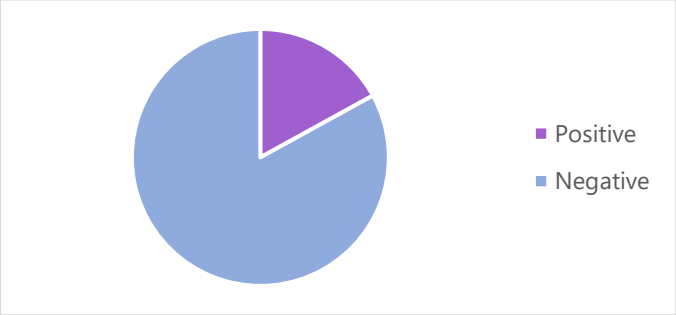

FIGURE 1. Results of the examination of Soil Transmitted Helminth eggs are described in pie charts

From Figure 1, it can be concluded that 5 samples were positively infected with Soil Transmitted Helminth (STH) parasite eggs, with a percentage value of 17%, while 25 samples were declared negative or not infected with Soil Transmitted Helminth (STH) parasite eggs, with a percentage value of 83%.

DISCUSSION

This study aims to determine the presence or absence of Soil Transmitted Helminth (STH) eggs in the nails of janitors in Wonocolo District, Surabaya City. This study starts by explaining to respondents the purpose of the examination, providing a little education about helminthiasis, then asking for consent and the right to refuse and guarantee the confidentiality of respondent data. An attitude of empathy and professionalism was shown towards the respondents. Respondents were asked to cut their nails using nail clippers provided by the researcher, and then a pot was provided to hold nail samples that had been given a sample code. Examination of nail samples was carried out using the Sedimentation method.

In this study, the examination of nail clipping samples of garbage cleaners was carried out at the Microbiology Laboratory of the Faculty of Health Sciences, Muhammadiyah University of Surabaya. Using the sedimentation method, where the specific gravity of the solution used is smaller than the worm eggs, so that the worm eggs will settle to the bottom of the tube. The principle of this method is that the centrifuge force can separate the suspension and supernatant so that the eggs will settle (Indriani, 2020).

Based on table 1 of a total of 30 samples, 5 samples were found to be positively contaminated, while the other 25 samples were not found to have Soil Transmitted helminth (STH) egg parasites. In the study, most of the cleaners were infected with *Ascaris lumbricoides* worms. This is in line with several theories which state that in Indonesia, *Ascaris lumbricoides* is endemic, with the number of sufferers reaching 20-90%. The worm disease with the highest prevalence compared to other diseases is ascariasis (Luxkiani, 2020).

Based on research (Listiany et al., 2020) it can be seen that the prevalence of *Ascaris lumbricoides* eggs on nails and the level of personal hygiene of janitors in Krian, Sidoarjo showed the results of 3 samples (12%) of nails of janitors who were positive for Soil Transmitted Helminth (STH) from a total of 25 samples. So that this study shows the results of a higher percentage of helminthiasis infection than previous studies.

According to the researchers, the discovery of Soil Transmitted Helminth (STH) eggs in 5 nail samples of janitors with sample codes A6, A9, A14, A18, A19 was due to several factors including poor personal hygiene such as not washing hands using soap, not cutting nails once a week and not wearing Personal Protective Equipment (PPE), especially gloves and footwear at work so that it is very likely that the eggs of Soil Transmitted Helminth (STH) parasites, especially Ascaris lumbricoides, enter the body of janitors through skin penetration. This is in line with researchers (Gea, 2022) who mentioned that humid soil conditions with a lot of garbage are the right habitat for nematodes to live and breed. The highly variable soil texture consisting of sand, dust, and clay soil allows the life and breeding of Soil Transmitted Helminth (STH) worm eggs to become infective worms that transmit helminthiasis. The condition of trash bins that do not meet health requirements can cause disease, one of which is helminthiasis. Uncovered, impermeable, and smelly bins are often inhabited by insects. In addition to direct contamination from soil to nails, insects, such as flies, can also transmit helminthiasis by nesting in dirty garbage and carrying worm eggs that previously landed on the ground and then landed on food.

Based on the results of the research obtained, there are still many waste cleaners who are infected with Soil Transmitted Helminth (STH) eggs, It is hoped that the Temporary Disposal Site (TPS) can facilitate the cleaners by conducting routine treatment every 6 months. Efforts can also be made to eradicate helminthiasis with promotive and preventive measures. Promotive action is by providing information through health counseling directly and through electronic media, and taking preventive action by controlling risk factors, including environmental hygiene, personal hygiene, and carrying out treatment by taking deworming drugs regularly every six months. For areas where the prevalence of helminthiasis is 10-50%, deworming is done once every six months, while for prevalence of helminthiasis less than 50%, deworming is done three times a year and prevalence <10%, no treatment is done but preventive and promotive measures are increased (Luxkiani, 2020).

CONCLUSION

Based on the results of this study, it can be concluded that on the nails of janitors at the TPS Wonocolo District Surabaya City, as many as 17% were found to have Soil Transmitted Helminth eggs, and 83% were not found to have Soil Transmitted Helminth eggs. It is recommended that janitors always maintain personal hygiene and always apply clean and healthy living behavior, wash their hands using soap before and after eating, before and after work, after defecating, use personal protective equipment while working such as gloves and footwear, and cut nails at least once a week to prevent Soil Transmitted Helminth (STH) eggs infection.

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CONFLICT OF INTEREST

No conflict of interest

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