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Characteristics of the Nutritional Status of Children Under Five With the Incidence of Infection Soil Transmitted Helminths (STH) and *Strongyloides stercoralis* in Manado City

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ABSTRACT

Parasitic infections in the human digestive tract are common but rarely deadly. Worm infections contribute to other health problems such as diarrheal disease, malnutrition and anemia. Malnutrition can inhibit physical development and intelligence in children during growth and reduce endurance. This study aims to determine the picture of soil transmitted helminth (STH) and *Strongyloides stercoralis* infections in children under five year based on nutritional status in the city of Manado. This type of research is descriptive in order to provide an overview of the nutritional status of children under five with STH infection and *Strongyloides stercoralis*. The population in this study were all children under five with undernutrition and malnutrition in the working area of the Kombos Health Center in Manado. Results of the study Based on the characteristics of the respondents 26.67% of children under five had undernourished status. The results of examination of worm infections using the Harada Mori, Kato Katz and Baerman Test methods show that only 1 (one) positive sample was found of the STH parasite species of *Ascaris lumbricoides*. Suggestions in this study need to be done STH examination with a large number of samples and STH examination needs to be done at least 3 times.

Keywords : Nutrition Status, Children under five, Soil Transmitted Helminths, *Strongyloides stercoralis*.

INTRODUCTION

The prevalence of intestinal worms in Indonesia is generally caused by two things namely climate and lifestyle. Tropical climates with temperature, humidity and high rainfall are good conditions for worm egg development. Changes in climatic conditions will affect changes in parasitic development. Knowledge and lifestyle of people who are still far from healthy living habits, inadequate sanitation facilities, the ability to not wear footwear and gloves when working while lack of concern about personal hygiene (Chadijah *et al*; 2013; Fox *et al*; 2015).

Worm infections in the human digestive tract are common but rarely deadly. At the stage of development of children under five is quite susceptible to various diseases, including diseases associated with lack and excess nutrient intake due to worm infections that can damage the intestinal mucosa resulting in impaired nutrient absorption. Worm infections contribute to other health problems such as diarrhea, malnutrition and anemia. Malnutrition can inhibit physical development and intelligence in children during growth and reduce endurance (Malla *et al*; 2004), Malnourishment and infection can be linked together in a cycle where malnutrition can cause a person to be susceptible to infectious diseases. Data on nutritional status checking for children under five year based height measurement for age, the number of children under five is very short 14.1%, short 17.3% and normal 68.6%. The percentage of stunting (the number of children under five is very short and short) is more than the percentage of the national average. (Katona and Katona-apte, 2008; Papier *et al*; 2014).

Most cases of helminthiasis are caused by otherworms Soil Transmitted Helminths (STH) such as *Ascaris lumbricoides*, *Trichuris trichiura*, and Hookworm. According to research by Silva *et al* (2015), Khieu *et al* (2014) and Khieu *et al* (2013), cases of strongyloidiasis occur in many tropical countries with low socioeconomic conditions and poor sanitation conditions. Infection *S. stercoralis* also influenced by behavior, including the habit of not wearing footwear when outside the home. Although *S. stercoralis* is also included STH infection, infection *S. stercoralis* can also occur on its own without the need for interaction with the soil. This is because *S. stercoralis* has an autoinfection mechanism, because eggs can develop into filariform larvae in the intestine or rectum and then make an infection. Cases of autoinfection can occur in malnourished and immunosuppressed patients (Satoskar *et al*, 2009, Silva *et al*, 2015).

The absence of national helminthiasis data that is reported regularly causes a lack of knowledge about the development of helminthiasis in Indonesia. North Sulawesi does not have published helminthiasis data, this can be due to lack of research interest in the field of parasitology, especially research on helminthiasis infection. Research

conducted by Suharman *et al* (2013) on the relationship of personal hygiene with helminthiasis among elementary school students in Bolaang Mongondow Utara District shows the prevalence of helminthiasis by 20% (Suharman *et al*, 2013).

This research is expected to be the first step to find out the prevalence of STH and *S. stercoralis* in children under five and their relationship to the growth of them. This research is also expected to be able to give a little picture about the distribution of *S. stercoralis* due to the absence of data about the distribution of *S. stercoralis* in Indonesia

MATERIAL AND METHODS

This type of research is descriptive. The design of this study to determine the status and intensity of STH and infections *S. stercoralis*. The research site was conducted in the Manado City area involving 15 respondents. The selection of the study area is based on the nutritional status data of children under five. When the study was conducted in June to September 2018. The population was all children under five in the Manado City area whose nutritional status was recorded, respondents had not taken worm medicine in the last 3 months. Data analysis was performed descriptively.

RESULTS

1. Characteristics of Respondents

Table 1. Characteristics of Respondents by Gender

Gender	N (%)
Men	7 (46.67)
Women	8 (53.33)
Total	15 (100)

Table 1 shows respondents sex gender of male 46% and female 53%.

Table 2. Characteristics of Respondents based on Nutritional Status Nutritional

Status	N (%)
Poor Nutrition	11 (73.33)
Malnutrition	4 (26.67)
Total	15 (100)

Table 2 shows the characteristics of respondents with underweight nutritional status 73.33% and poor nutrition 26.67%.

Table 3. Characteristics Behavior of Respondents

Behavior	N (%)
Wear footwear when playing	
Yes	6 (40)
No	9 (60)
Washing hands before eating	
Yes	6 (40)
No	9 (60)
Playing ground	
Yes	13 (86.67)
No	2 (13.33)
Defecate in the toilet	
Yes	8 (47.67)
No	7 (53.33)

Table 3 shows the characteristics of respondents based on the behaviour. The children under five wearing footwear when playing 40%, washing their hands before eating 40%, playing in the ground 86, 67% and defecation in the toilet 47.67%.

2. Worm Examination Results

Table 5. Worm Examination Results by Harada Mori, Kato Katz and Baerman Test

Sample	Methods			Remarks
	Harada Mori	Method Kato Katz	Method Baerman MethodTest	
Positive (+)	0	1	0	<i>Ascaris lumbricoides</i>
Negative (-)	15	14	15	

Results of examination of worms using Harada Mori method were negative results, Kato Katz method positive number of 1 sample *Ascaris lumbricoides* and Baerman Test method were negative results.

DISCUSSIONS

STH infections can affect all age groups, especially in children as a risk group. Research conducted by Chadijah et al (2013) in Palu and Donggala shows that the age group of 18 - 40 years is infected with intestinal worms which is higher than other age groups at 32%. Research was also conducted in the Akonolinga health district - Cameroon to see whether adults contribute to STH transmission in the age range of 18 - 91 years; the results showed 51.5% of the samples collected were infected with STH (Chadijah *et al*; 2013; Bopda *et al*; 2016).

Based on the characteristics of respondents 26.67% of children under five have poor nutritional status, the behavior of respondents 60% do not wear footwear, 40% of toddlers do not wash pliers before eating, 86.67% play on the ground and 53.33% of respondents do not defecate in latrines and based on demographics 86.67% of parents earn less than regional minimum salary, 66.67% of parents work as construction workers, 53.33% of sources of clean water from wells and 13.33% no toilet at home.

The results of this study have not shown a positive relationship between helminthiasis with malnutrition and respondents behavior. Some factors which have not been descriptive in nature include the number of samples of only 15 respondents, the STH examination only once. Inversely with the opinion of Renati *et al*; 2015 that intestinal worms can cause malnutrition and anemia which can affect physical development, decrease intelligence and work productivity and decrease endurance so that patients become vulnerable to other diseases.

CONCLUSION

Based on the characteristics of respondents 26.67% of children under five have poor nutritional status, the behavior of respondents 60% do not wear footwear, 40% do not wash pliers before eating, 86.67% play on the ground and 53.33% do not defecate in latrines. Based on demographic, 86.67% of parents earning less than regional minimum salary, 66.67% of parents working as construction workers, 53.33% of sources of clean water from wells and 13.33% of no toilet at home. The results of examination sample using the Harada Mori, Kato Katz and Baerman Test methods show that only 1 (one) positive sample found STH parasite species of *Ascaris lumbricoides*.

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