Risk Factors of STH Infections in Children Aged 6-12 Years in SubVillages II and IV Manusak Village of East Kupang District - Kupang Regency Year 2019

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ORIGINAL ARTICLE

Risk Factors of STH Infections in Children Aged 6-12 Years in Sub-Villages II and IV Manusak Village of East Kupang District - Kupang Regency Year 2019

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ABSTRACT

Worm infection is one of the health problems in all countries including Indonesia. The most frequent helminthiasis is an infection caused by helmets of the Soil Transmitted Helminth (STH) group. Primary school age children are an age group that is susceptible to intestinal worms. Worm infections can have serious consequences if they are not treated by administering intestinal worms and a clean and healthy lifestyle from the person. This study was conducted with the aim to determine risk factors such as the characteristics of children and parents, children's behavior, and environmental sanitation associated with STH infections in children aged 6-12 years in Sub-Village II and IV Manusak Village, East Kupang District, Kupang Regency in 2019. This research uses analytic observational research with cross sectional study design. Research subjects were 56 children. Data were collected using a questionnaire and then analyzed using the Chi Square test (X2). Worm infestation is done by indirect method of Kato-Katz type. Based on the results of the Kato-Katz examination found Ascaris lumbricoides eggs in 54 children (96.4%). Chi Square test results showed that the risk factor for STH infection was the habit of not washing hands with (P <0.05).

Keywords: Characteristics, Behavior, Sanitation

INTRODUCTION

Worm disease is an endemic and chronic disease that occurs due to the entry of worm parasites into the human body. Worm infections can generally enter through the mouth, or directly through wounds on the skin. (Zulkoni, 2011). Based on transmission media, intestinal helminth are divided into 2 groups, namely Soil Transmitted Helminth (STH) whose transmission media are soil and non Soil Transmitted Helminth (STH) whose transmission media are not soil (Hairani&Annida, 2012).

As a tropical region, with soil that is moist and protected from sunlight, Indonesia is a good place for worms whose life cycle through the ground. The economic and social level of the Indonesian people is not evenly distributed which impacts in the bad community's knowledge and awareness to maintain personal and environmental hygiene (Kusmi et al., 2014).

Factors that are closely related to this disease include hygiene and sanitation, the results of several studies say that personal hygiene such as washing hands with soap, wearing footwear, the habit of cutting nails is the best way to prevent transmission from helminthiasis. Besides, sanitation is one of the risk factors for helminthiasis (Kartini et al., 2018).

The village of Manusakis one the villages located in East Kupang District, Kupang regency. While, sub-villages II and IV are two sub-villages of 4 sub-villages in the village of Manusak. The majority of the population works as farmers.According to a survey conducted by researchers, the majority of the population are refugees from East Timor. Communities in this area have low environmental sanitation conditions, children of primary school age who play often do not use footwear, around residents' homes there is also mud where pets are also just left in front of the house or next to the house without having a cage, therefore it cannot be denied that this includes factors that can cause a person infected with helminthiasis by the Soil Transmitted Helminths (STH) group of worms.

MATERIALS AND METHOD

This research was an analytic observational study with a cross sectional study design. The study was conducted in 5 RTs of Sub-Villages II and IV of Manusak Village (RT 8,9,10 out of 11 RTs in Sub-village II and RT 9,10 out of 4 RTs in sub-village IV) which was conducted for one week in March 2019. The study population was all children aged 6-12 years who live in 5 RTs and were selected as samples. The sample selection is done by Multistage Random Sampling Saturated Samples, the number of samples taken as many as 56 samples. To examine the relationship between variables and STH infection incidence researchers used a questionnaire containing several questions. Meanwhile, to see the STH parasite worm, an indirect method of Kato Katz method was examined with the required materials including faeces and kato solution (malachite green, glycerin and aquades). The test results are positive if worm eggs were found in the specimen examined. After univariate analysis and bivariate analysis in the form of chi square tests on each variable, the results are considered a risk factor if the P value <0.05.

RESULT AND DISCUSSION

Research on risk factors for Soil Transmitted Helminth (STH) infection in children aged 6-12 years in Sub-Villages II and IV of Manusak Village

Table 1: Distribution of types of STH on children 6-12 years old

STH Type Distributin	Amount	(%)
Ascaris lumbricoides	54	96.4
Trichuris trichura	0	0
Hookworm	0	0
Negative	2	3.6
Total	56	100

The results of this study showed that all respondents who were infected with helminthiasis were infected with Ascaris lumbricoides with a positive percentage of 96.4% and another negative helminthiasis was 3.6%. These results support the study of jalaluddin (2009) on elementary school students in Blang Mangat Subdistrict, Lhokseumawe City in 2009 which showed a 52.7% positive rate of helminthiasis. However, the results of this study differ from community service conducted by Djuma, (2018) about the prevalence of helminthiasis infections in STH students in NaibonatInpres Elementary School, Kupang Timur District, Kupang Regency, which results in 20.5% of the positive student population infected with STH The differences in helminthiasis infection rates in each of the results of this study are due to differences in risk factors in several research locations, especially those related to child behavior, environmental sanitation and also the influence of geographical conditions, as well as the social culture of the local community.

Table 2: Characteristic distribution of children and parents

Characteristic	N	(%)
Age		
a. 6 years	16	28.6
b. 7 years	12	21,4
c. 8 years	8	14.3
d. 9 years	9	16,1
e. 10 years	4	7,1
f.11years	3	5,4
g. 12 years	4	7,1
Total	56	100
Gender		
a. Male	30	53,6
b. Female	26	46,4
Total	56	100
Parent education		
a. Non-school	28	50,0
b. Elementary School	14	25,0
c. Junior High School	8	14,3
d. Senior High School	5	8,9
e. University	1	1,8
Total	56	100
Parent Occupation		
a. Farmer	53	94,6
b. Civil Officer	2	3,6
c. Entrepreneur	1	1,8
Total	56	100
Parent Income		
a. <IDR.1.500.000	53	94,6
b. >IDR.1.500.000	3	5,4
Total	56	100

The results showed that the largest number of samples taken from the age of 6 years, amounting to 28.6% (16 people). Sex characteristics are dominated by male sex, which consists of 53.6% (30 people) male, Characteristics of the level of education of parents are dominated by parents who are not in school as many as 28 people (50%). The occupational characteristics of parents are dominated by parents who work as farmers, namely 53 people (94.6%). Characteristics of parental income are dominated by parents with incomes below 1.5 million, which is about 94.6% of parents with income below 1.5 million.

Table 3: Distribution of Child Behavior

Child Behavior	N	(%)
Habit of Wahing hands		
Never/Rare	46	82,1
Yes	10	17,9
Nails Hygiene		
Dirty	32	57,1
Clean	24	42,9
Habit of wearing foot wear		
No	53	94,6
Yes	3	5,4
Defecation Habit		
Garden/yard	17	30,4
Toilet	39	69,6

The results showed that the habit of not wearing footwear was 94.6% (53 people), 30.4% (17 people) had defecation habits not in the toilet and there were 69.6% (39 people) had carried out defecation activities in the lavatory/family toilet, and 82.1% (46 people) have a habit of not washing hands before eating or after bowel movements and only 17.9% (10 people) always wash their hands before eating or after bowel movements. And nail hygiene in children aged 6-12 years in Hamlet II and IV of Manusak Village had 57.1% (32 people) unclean nails (32 people) and 42.9% (24 people) children who had clean nails.

Table 4. Distribution of Environtmental Sanitation

Environtmental Sanitation	N	(%)
Availability of Clean Water		
a. River	27	48,2
b. Well/water tank	29	51,8
Availability of toilet		
a. None	0	0
b. Family toilet	56	100
Availability ofgarbage		
a. None	47	83,9
b. Yes	9	16,1

Table 5: Distribution of Relationship between Child Characteristics with Transmitted Helminth Soil Infection

Variable Infection STH	Positive	Negative		Value
6-8 year age	36 (64,3)	1 (1,8)	37 (66)	1,000
9-12year	18 (32,1)	1 (1,8)	19 (34)	
Gender Male	29 (51,8)	1 (1,8)	30(53,6)	1,000
Female	25 (44,6)	1 (1,8)	26(46,4)	
Parent Education TidakSekolah	27 (48,2)	1 (1,8)	28 (50)	0,628
Elementar	14(25)	0	14(25)	
Junior High School	7 (12,5)	1 (1,8)	(14,3)	
Senior High School	5 (8,9)	0	(8,9)	
University	1 (1,8)	0	1 (1,8)	
Parent Occupation Farmer	51 (91)	2 (3,6)	53(94,6)	0,943
Civil Officer	2 (3,6)	0	2 (3,6)	
Entrepreneur	1(1,8)	0	1 (1,8)	
Parent Income				1,000
<1.500.000	51 (91)	2 (3,6)	94,6)	
>1.500.000	3 (5,4)	0	3 (5,4)	

The results showed that 48.2% (27 families) had water sources from river water and families that used well water or tank water were 51.8% (29 families).Toilet ownership in every house has a family toilet, 100% (56 families) have a

toilet and 83.9% (47 households) do not have trash bins in their homes and 16.1% (9 households) have spaces available garbage in his house.

The child age sub-variable with a p Value of 1,000 (> 0.05) has no relationship with the incidence of STH infection. The results showed that helminthiasis was higher in children aged 6-8 years (66%) with 64.3% infected with STH. These results are consistent with research conducted by Faridan, et al (2013) on elementary students in Banjarbaru City the statistical test results obtained the value of P Value 0.931 (> 0.05). Child sex sub-variable with P Value 1,000 (> 0.05) means that there is no significant relationship with the incidence of STH infection. The number of Soil Transmitted Helminth infections is more common in boys than girls but there is no significant difference. This is because the playing habits of boys and girls are almost the same, namely using the land as a medium ofplay such as playing marbles, or playing games for girls so as to make children directly contact with the ground and then not immediately wash their hands. This result is in accordance with research conducted by Salbiah (2008) on elementary students in Medan Belawan District with the statistical test results obtained P Value of 0.943 (> 0.05).

Assessment of the Parent Education sub-variable obtained P Value 0.628 (> 0.05) meaning that there is no significant relationship with the incidence of STH infection, this result is in accordance with research conducted by Sumanto (2010) in RejosariKarangawenDemak Village which shows that people's education age is not significantly related and is not a risk factor for helminthiasis in children.

Table 6: Relationship between Child Behavior and Infection ofSoil Transmitted Helminth

Variable Infekoion STH	Positive	Negative		Value
Nails Hygiene Dirty	32 (5711)	0	32 (57,1)	0,179
Clean	22 (39,3)	2 (3,6)	24 (42,9)	
Habit of Washing Hands Never/Rare	46 (82,1)	0	46 (82,1)	0,029
Yes	8 (14,3)	2 (3,6)	10 (17,9)	
Habit of Wearing Footwear Never/Rare Yes	51 (91) 3 (5,4)	2 (3,6) 0	53 (94,6) 3 (5,4)	1,000
Defecation Habit Not in Toilet	17 (30,4)	0	17 (30,4)	1,000
In toilet	37 (66)	2 (3,6)	39 (69,6)	

Sub-variable occupation of children's parents has no relationship with the incidence of STH infection where P Value is 0.943 (> 0.05). These results are in accordance with research conducted by Sumanto (2010) in RejosariKarangawenDemak Village, showing that parental work is not significantly related and is not a risk factor for STH infection. This is because even though parents have jobs as farmers, their daily contact is always with land which can cause STH infections. however, if the person has a healthy life behavior and always pays attention to individual hygiene then based on this research working as a farmer is not said to be a risk factor.Parent's income sub-variable P Value 0.782 (> 0.05) on parental income also shows no relationship with the incidence of STH infection. This can happen because a person with a low income if he has a healthy lifestyle and every 6 months children are always given worm medicine which is shared free of charge by the health center, based on this study parental income is not said to be a risk factor.

Sub variable habit of washing hands before eating and after defecation using soap and water has an important role in preventing STH worm infection, because washing hands using water and soap is very effective in removing dirt, dust and worm eggs attached to the surface of the skin and nails. . Based on the results of the study showed that the sub-variable hand washing habit was associated with a significant incidence of STH infection with P Value 0.029 (<0.05) where most of the children 82.1% had the habit of not washing their hands before eating, especially children aged 6-12 years have a tendency not to wash hands with soap at the right steps after contact with the ground or after defecation while others do hand washing before eating or after defecation (17.9%). Therefore, hand washing has a significant relationship with the transmission of Helminth Soil Transmitted. The results of this study are in line with research conducted by Jalaluddin (2009) on elementary school students in Blang Mangat Subdistrict, Lhokseumawe City, which showed a significant relationship between hand washing habits and the incidence of STH infections with a P Value of 0.010 (<0.05).Sub variable nail hygiene in the chi square test to assess the relationship obtained P Value 0.179 (> 0.05) which means there is no relationship between nail hygiene with the incidence of STH infection. These results are different from the study conducted by Ludji (2018) in elementary school children in the District Tambolaka City, Southwest Sumba Regency, the results of P value of 0.010 (<0.05) which shows that there is a significant relationship with the incidence of helminthiasis in children. This difference in results is due to other factors from the behavioral aspects of children aged 6-12 years which can reduce the risk of STH infection, namely the habit of washing hands before eating or after defecation.

The habit sub-variable using footwear based on the chi square test to assess the relationship was obtained P Value 1,000 (> 0.05) which means there was no relationship between footwear use and the incidence of STH infections. These results differed from research conducted by Pertiwi, et al (2013) the elementary school students in the island of BarrangLompo, Makassar City with the chi square test results obtained P Value 0,000 (<0.05) so that the habit of using footwear has a significant relationship to the incidence of STH infection. This difference in results is due to other factors of behavioral aspects of children aged 6-12 years which can reduce the risk of STH infection, namely the habit of washing hands before eating or after defecation because the use of footwear is closely related to STH infection specifically in the type of hookworm (Hookworm) whereas on microscopic examination results all children infected with Ascaris lumbricoides worm.

The defecation habit sub variable shows P Value 1,000 (>0.05) which means there is no relationship

between the habit of defecating with the incidence of STH infection.

These results are different from the study conducted by Pertiwi, et al (2013) on elementary school students on BarrangLompo island, Makassar City with Chi square test results obtained P Value 0,000 (<0.05) so that bowel habits have a significant relationship to the incidence of STH infection. This difference in results is due to other factors of behavioral aspects of children aged 6-12 years which can reduce the risk of STH infection, namely the habit of washing hands before eating or after defecation, due to bowel habits.

Table 7: Relationship of Environmental Sanitation with Transmitted Helminth Soil Infection

Variable	InfektionSTH Positive	Negative	Total	P value
Toilet Ownership None	54(96,4)	2(3,6)	56 (100)	-
Available				
Availability of Clean water source				1,000
River	27(48,2)	0	28(48,2)	
WellWater Tank	27(48,2)	2(3,6)	29 (51,8)	
Availability of Garbage				1,000
None	45 (80,4)	2(3,6)	47 (84)	
Available	9(16)	0	9 (16)	

The toilet ownership sub-variable, based on observations and direct interviews with respondents, it is known that all respondents who were made as research subjects have family toilets so that toilet ownership has no relationship with the incidence of STH infections. However, based on observations of the condition of latrines in the community is very alarming, namely the condition of slum latrines, the condition of septic tanks that are not in accordance with health standards and the lack of clean water in the toilet. Despite the availability of latrines in every family, there are still many children who defecate in the yard or garden, this habitual factor makes it difficult to assess the relationship betweenavailability of latrines with the incidence of STH infections in children.

Sub variable availability of clean water shows P Value 1,000 (> 0.05). The quality of this water source is dominated by families who use dug well water or bore wells to meet their daily needs, although not a few families still use river water as their water source but the water source is not a risk factor in this study because water is consumed when Containing intestinal parasites has been prevented by boiling water before it is used or drunk. The results of this study are in accordance with research conducted by Hardiyanti and Umniyanti (2017) which shows that there is no relationship between the quality of water sources with intestinal parasitic worm infections with P Value 1,000 (> 0.05).

Sub variable trash availability indicates that P Value 1,000 (> 0.05) means that there is no relationship between ownership of family trash with STH infection. The results of this study are in line with research conducted by Kartini (2017) in children aged 1-5 years in Rw 07 Geringging, Rumbai Coastal District, which shows that there is no relationship between the availability of rubbish bins with STH infection with a P Value of 0.168 (> 0.05) which means there is no relationship between the availability of trash cans and the incidence of STH infections. However, the results of this study differ from the results of research conducted by Fitri, et al (2012) in elementary school students in the Angkola Timur District of South Tapanuli Regency which shows a significant relationship between trash bin ownership and worm infections with a P Value 0,000 (< 0.05). There is no relationship between the ownership of trash cans and the incidence of STH infections. It can also be caused by other factors such as nutritional status, parents' knowledge of environmental sanitation so that the child is not susceptible to helminthiasis.

CONCLUSION

The prevalence of Soil Transmitted Helminth infections in children aged 6-12 years in Hamlet II and IV in Manusak Village is 96.4% and all infected with only one species namely Ascaris lumbricoides.

There is one factor that has been proven to have a relationship and is a risk factor for STH infection, namely the habit of washing hands with P Value 0.029 but has no relationship with age, gender, level of parental education, parents' occupation, parental income, nail hygiene, bowel habits, habit of using footwear, ownership of latrines, availability of clean water and availability of trash.

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