

## Determinant Factors of Incidence of Helminthiasis among Student of SD Inpres 42 Taman Ria in Kelurahan Wosi Manokwari District

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### ABSTRACT

**Background:** The behavior of the people in the Wosi village still pollutes the environment with inappropriate disposal of feces, i.e. at times in rivers which is used for bathing, washing clothes and household appliances.

**Methods:** This study is an observational analytic study that aims to determine the effect of two or more variables. This study explains the relationship affects and is influenced by the variables to be studied. Using a cross sectional study approach with data collection carried out simultaneously at one time.

**Results:** There is no sex relationship with the incidence of helminthiasis in Taman Ria Elementary School 42 students in Wosi Village, Manokwari Regency (p-value 0.734; RP = 1.080; CI95% (0.793 - 1.472)). There is no tribal relationship with the incidence of helminthiasis in students of Taman Ria Elementary School 42 in Wosi Village, Manokwari Regency (p-value 1,000; Rp = 1,012; CI95% (0,740 - 1,385)). There is a habitual defecation relationship with helminthiasis in Taman Ria Elementary School 42 students in Wosi Village, Manokwari Regency (p-value 0,000; RP = 2,081; CI95% (1,642 - 2,638)). There is a relationship between the habit of washing hands and the incidence of helminthiasis in students of Inpres 42 Park Ria Elementary School in Wosi Village, Manokwari Regency (p-value 0.007; RP = 1.557; CI95% (1,154 - 2,100)). There is a relationship between snacking habits and the incidence of helminthiasis in Taman Ria Elementary School 42 students in Wosi Village,

Manokwari Regency (p-value 0.016; RP = 1.496; CI95% (1,093 - 2,046)). There is a relationship between the habit of using footwear and the incidence of helminthiasis in students of SD 42 Inpres Taman Ria in Wosi Village, Manokwari Regency (p-value 0.004; RP = 1.603; CI95% (1,172 - 2,192)).

**Conclusion:** The dominant factor associated with helminthiasis in Taman Ria Elementary School 42 students in Wosi Village, Manokwari Regency is the habit of defecation, hand washing habits and the habit of playing on the ground.

**Keywords:** Incidence of helminthiasis, footwear, defecation, hand washing

### INTRODUCTION

Based on data from the Jayapura City Health Service in 2006 there were 891 helminthic infections with helminthiasis and in 2007 it increased to 936 people with helminthiasis. To support data on helminthiasis infection, the City Health Office of Jayapura conducted land checks in the Central Koya area on 15 houses. 9 houses were declared positive for worm eggs. The activity was in fact only carried out in 2006. Whereas in 2007 and 2008 there was no land inspection (<http://cahyowu.blogspot.com/2009>). Research conducted by Romi Purnawati in elementary school children at Koso Koya Elementary School Abepura District, Jayapura obtained 55.4% worm positive results, with the most infections by Hookworm 52.8%, *Ascaris lumbricoides* 13.9% and *Trichuris trichiura* 8.3 %. While

the research conducted by Yuanita Soraya Amin in preschool kindergarten children in the Waena Community Health Center work area, Jayapura received 78% positive helminthiasis results, and the type of worm that infected 78 kindergarten children preschool age 100% *Ascaris lumbricoides*.

Based on the results of research conducted by the authors on elementary school children in Wosi in 2009, helminthiasis was 65.1%. The results of the preliminary survey at Wosi Village and Sanggeng Urban Village are some elementary school children during school breaks, meals do not wash their hands, and some elementary school children play in the school yard, some do not use footwear / shoes. Dina Bisara and Mardiana's research in 2010 around the former coal mining settlement in Mentewe District, South Kalimantan Tanah Bumbu Regency. From the results of the study found in 106 primary school children examined, as many as 18 children (17%) were positive for worms, with parasite rates of 7 children (38.9%) *Ascaris lumbricoides*, 2 children (11.1%) *Trichuris trichiura*, 3 children (16.7%) Hookworm, 5 mix children (27.8%), namely; 3 children were found with 2 types of *Ascaris lumbricoides* and *Trichuris trichiura* worms and 2 children were found with 2 *Ascaris lumbricoides* and *Hymenolepis nana* worm species (<https://media.neliti.com>)

The population of Manokwari Regency is 170,897 people, the total population of Wosi is 20,249. Most of the people's livelihoods are civil servants, the private sector, ABRI and gatherers. Environmental factors and behavior of people in Manokwari District make the greatest contribution to the degree of health, especially in coastal areas and villages. The behavior of the people in the wosi village still pollutes the environment with inappropriate disposal of feces, i.e. at times in rivers which is used for bathing, washing clothes and household appliances. And there is a high level of humidity, so that the environmental conditions are very

influential in the transmission of helminthiasis.

Wosi is one of the regions in the Wosi sub-district. The settlement is quite dense and slum. In some places there are still a number of small children who defecate in any place like in a gutter (sewer) and when it rains the water can overflow into the surrounding area. There are several sub-districts in Wosi, including SD Inpres Taman Ria Wosi, SDN 06 Wosi. The habit of children in school often releases footwear when playing during school breaks. The reason the authors conducted a study of the prevalence of soil-borne worm determinant factors in elementary school students in Wosi Village, Manokwari District was from the background of the above problems, because there were no inspection and reporting data at the Manokwari District Health Office, and so far in 14 Puskesmas worm disease in the service.

## **2. MATERIALS AND METHODS**

### **2.1. Type of Research**

This study is an observational analytic study that aims to determine the effect of two or more variables (Sugiyono, 2013). This study explains the relationship affects and is influenced by the variables to be studied. Using a cross sectional study approach with data collection carried out simultaneously at one time (Notoatmodjo, 2012).

### **2.2 Place and Time of Research**

The place of the study was conducted at SD Inpres Taman Ria Wosi and SDN 06 Wosi and the time of the study was conducted in September 2018.

### **2.3. Population and Study Samples**

The population in this study were elementary students in grades 1- 5 of SD Inpres 42 Taman Ria Wosi, SD Inpres 42 Kelurahan Wosi as many as 174 people. The sampling technique uses saturated sampling or as many as 174 total populations.

### 3. RESULTS

#### Bivariate Analysis

##### a. Sex relations with helminthiasis

Table 1. Sex relations with helminthiasis in Taman Ria Elementary School 42 students in Wosi Village, Manokwari Regency

No	Sex	Incidence of helminthiasis				n	%
		Yes		No			
		n	%	n	%		
1	Male	49	50,5	48	49,5	97	100
2	Female	36	46,8	41	53,2	77	100
Total		85	48,9	89	51,1	174	100
<i>p-value</i> = 0,734; RP = 1,080; CI95% (0,793 – 1,472)							

Table 1 shows that out of 97 children of male sex there were 49 people (50.5%) experiencing intestinal worms and 48 people (49.5%) not having worms. Of the 77 female children there were 36 people (46.8%) experiencing intestinal worms and 41 people (53.2%) not having worms. The results of the chi square statistical test on the significance value of 95% ( $\alpha = 0.05$ ) obtained *p-value* 0.734 or  $p > \alpha$  (0.05). This means that there is no age relationship with helminthiasis in Taman Ria Elementary School 42 students in Wosi Village, Manokwari Regency. Prevalence ratio (RP) = 1.080; CI95% (0.793 - 1.472) which was interpreted to mean that age was not significant with helminthiasis in children.

##### b. Tribal relationships of children with helminthiasis

Table 2. Tribal relationship between children and helminthiasis in Taman Ria Elementary School 42 students in Wosi Village, Manokwari Regency

No	Tribal	Incidence of helminthiasis				n	%
		Yes		No			
		n	%	n	%		
1	Papua	32	49,2	33	50,8	65	100
2	Non Papua	53	48,6	56	51,4	109	100
Total		85	48,9	89	51,1	174	100
<i>p-value</i> = 1,000; RP = 1,012; CI95% (0,740 – 1,385)							

Table 2 shows that out of 65 children from Papuan tribes there were 32 people (49.2%) who experienced intestinal worms and 33 people (50.8%) had no worms. Of the 109 children from the Non Papuan tribe there were 53 people (48.6%) experiencing intestinal worms and 56 people (51.4%) not having worms. The results of the chi square statistical test on the significance value of 95% ( $\alpha = 0.05$ ) obtained *p-value* 1,000 or

$p > \alpha$  (0.05). This means that there is no tribal relationship with the incidence of helminthiasis in the students of SD 42 Inpres Taman Ria in Wosi Village, Manokwari Regency. Prevalence ratio (RP) = 1.012; CI95% (0.740 - 1.385) which was interpreted to mean that the tribe was not significant with helminthiasis in children.

##### c. Relationship between defecation habits and helminthiasis

Table 3. Relationship between defecation habits and the incidence of helminthiasis in 42 Inpres Elementary School students at Taman Ria in Wosi Village, Manokwari Regency

No	Defecation habits	Incidence of helminthiasis				n	%
		Yes		No			
		n	%	n	%		
1	Bad	22	88	3	12	25	100
2	Good	63	42,3	86	57,7	149	100
Total		85	48,9	89	51,1	174	100
<i>p-value</i> = 0,000; RP = 2,081; CI95% (1,642 – 2,638)							

Table 3 shows that of the 25 children with poor latrine habits there were 22 people (88%) experiencing intestinal worms and 3 people (12%) not having worms. Of the 149 children with good latrine habits there were 63 people (42.3%) who experienced intestinal worms and 86 people (57.7%) had no worms. The results of the chi square statistical test on the significance value of 95% ( $\alpha = 0.05$ ) obtained *p-value* 0,000 or  $p < \alpha$  (0.05). This means that there is a relationship between the habit of defecation and the incidence of helminthiasis in students of Inpres 42 Park Ria Elementary School in Wosi Village, Manokwari Regency. The prevalence ratio (RP) = 2.081; CI95% (1,642 - 2,638) interpreted that poor bowel habits tend to be exposed to worms by 2,081 times compared to children who have good defecation habits.

##### D. Relationship between Hand Washing habits and helminthiasis

Table 4. Relationship between Hand Washing Habit and the incidence of helminthiasis in 42 Inpres Elementary School students at Taman Ria in Wosi Village, Manokwari Regency

No	Hand Washing Habit	Incidence of helminthiasis				n	%
		Yes		No			
		n	%	n	%		
1	Bad	44	62	27	38	71	100
2	Good	41	39,8	62	60,2	103	100
Total		85	48,9	89	51,1	174	100
<i>p-value</i> = 0,007; RP = 1,557; CI95% (1,154 – 2,100)							

Table 4 shows that out of 71 children with bad hand washing habits there were 44 people (62%) experiencing intestinal worms and 27 people (42.3%) not having worms. Of the 103 children with good handwashing habits, there were 41 people (39.8%) experiencing intestinal worms and 62 people (60.2%) not having worms. The results of the chi square statistical test on the significance value of 95% ( $\alpha = 0.05$ ) obtained p-value 0.007 or  $p < \alpha$  (0.05). This means that there is a relationship between the habit of washing hands and the incidence of helminthiasis in students of Inpres 42 Park Ria Elementary School in Wosi Village, Manokwari Regency. The prevalence ratio (RP) = 1.557; CI95% (1,154 - 2,100) which was interpreted to mean that poor handwashing habits tended to be children affected by intestinal worms by 1,557 times compared to children who had good hand washing habits.

#### e. Relationship to Snacking with helminthiasis

Table 5. Relationship between snacking habits and the incidence of helminthiasis in 42 Inpres Elementary School students at Taman Ria in Wosi Village, Manokwari Regency

No	Snacking habit	Incidence of helminthiasis				n	%
		Yes		No			
		n	%	n	%		
1	Bad	50	58,8	35	41,2	85	100
2	Good	35	39,5	54	60,7	89	100
Total		85	48,9	89	51,1	174	100

*p-value* = 0,016; RP = 1,496; CI95% (1,093 - 2,046)

Table 5 shows that out of 85 children with bad snacking habits there were 50 people (62%) experiencing intestinal worms and 35 people (41.2%) not having worms. Of the 89 children with good snacking habits there were 35 people (39.5%) experiencing intestinal worms and 54 people (60.7%) not having worms. The results of the chi square statistical test on the significance value of 95% ( $\alpha = 0.05$ ) obtained p-value 0.016 or  $p < \alpha$  (0.05). This means that there is a relationship between snacking habits and the incidence of helminthiasis in students of Inpres 42 Park Ria Elementary School in Wosi Village, Manokwari Regency.

Prevalence ratio (RP) = 1,496; CI95% (1,093 - 2,046) interpreted that poor snacking habits tended to be affected by worms by 1,496 times compared to children who had good snacking habits.

#### f. Relationship between Habits of Using Footwear and helminthiasis

Table 6. The Habit of Relationship Using Footwear with helminthiasis in 42 Inpres Elementary School students at Taman Ria in Wosi Village, Manokwari Regency

No	Using Footwear	incidence of helminthiasis				n	%
		Yes		No			
		N	%	n	%		
1	Bad	50	61	32	39	82	100
2	Good	35	38	57	62	92	100
Total		85	48,9	89	51,1	174	100

*p-value* = 0,004; RP = 1,603; CI95% (1,172 - 2,192)

Table 6 shows that out of 82 children with habit of using bad footwear there were 50 people (61%) experiencing intestinal worms and 32 people (39%) not having worms. Of 92 children with good habits of using footwear there were 35 people (38%) experiencing intestinal worms and 57 people (62%) not having worms. The results of the chi square statistical test on the significance value of 95% ( $\alpha = 0.05$ ) obtained p-value 0.004 or  $p < \alpha$  (0.05). This means that there is a customary relationship between using footwear and helminthiasis in Taman Ria Elementary School 42 students in Wosi Village, Manokwari Regency. Prevalence ratio (RP) = 1,603; CI95% (1,172 - 2,192) which is interpreted that the habit of using bad footwear tends to be affected by worms by 1,496 times compared to children who have a habit of using good footwear.

## 4. DISCUSSION

### 4.1 Sex relations with helminthiasis

Based on the results of the study, it was found that 50.5% of children who were male had intestinal worms while 46.8% of them were female worms. This shows that there is a proportion of the same number that is likely to have an incidence of helminthiasis in SD Inpres 42 Park Ria elementary students in Wosi Village, Manokwari Regency. The chi square

statistical test results on significance values were stated to have no relationship to age with helminthiasis in Taman Ria Elementary School 42 students in Wosi Village, Manokwari Regency and were protective factors which meant that the absence of relationship was influenced by other stronger variables namely latrine habits, hand washing and the habit of playing on the ground.

This research is in line with the research conducted by Derek (2018) in students at SD Negeri 58 Manado with the incidence of infection Intestinal worms revealed that there was no sex relationship with helminthiasis in elementary students. Based on observations that there is no association with the incidence of helminthiasis between male and female sex is caused by their playing habits are almost the same that has more activity to contaminate the soil. Intestinal worm infections are more common because children who consume contaminated food and beverages from poor hygiene behavior, especially in washing hands after playing on the ground.

#### **4.1 Tribal relationships of children with helminthiasis**

Various ethnic groups can differ in habits, lifestyle and so on which can cause differences in morbidity or mortality. Social and cultural aspects greatly influence the life patterns of all humans and influence the behavior patterns of children (Notoatmodjo, 2011). The results were obtained from the results of the chi square statistical test obtained p-value 1,000 which stated no tribal relationship with the incidence of helminthiasis in students of SD 42 Inpres Taman Ria in Wosi Village, Manokwari District and was a protective factor with helminthiasis.

According to Peter (2003) in Yuliani (2007) risk factors that influence worm disease include ethnicity, culture and family. Haisl research found that in children from the Papuan tribe there were 49.2% experiencing intestinal worms while children from non-Papuan tribes had 48.6%

experiencing worms. This shows a proportion of the incidence of helminthiasis which is not much different.

The absence of a tribal relationship between children and helminthiasis is caused because the child has mingled and can adapt to one another so that there are similarities in behavior in behavior, including in play and hygiene behavior. In addition, there are similarities in the nature of housing and sanitation where technological and cultural developments, education and immigration can have an influence on the conditions of home sanitation and the behavior of local indigenous people.

#### **4.2 Relationship between defecation habits and helminthiasis**

The results of the study showed that out of 174 children there were 25% of children having poor BAB habits. Bad defecation is caused when children play outdoors, especially at times or in the garden and feel defecation; the child is usually defecating at times. Respondents with bad latrine habits as much as 88% experienced worms while respondents with good latrine habits as many as 42.3% experienced intestinal worms. The proportion of helminthiasis is lower in respondents who have good bowel habits in latrines.

The statistical test results show that there is a relationship between defecation behavior and helminthiasis in Taman Ria Elementary School 42 students in Wosi Village, Manokwari Regency and from the results of the prevalence ratio test it is interpreted that poor BAB habits tend to be affected by 2,081 times compared to children who have defecation habits well. This research is in line with previous research by Irawati (2013) which states that poor defecation / bowel habits are 6.3 times more likely to experience intestinal worms than children who have good defecation / bowel habits.

Poor defecation behavior in any place is thought to be a risk factor for worm infections. Theoretically, worm eggs need

soil media for their development. The presence of worm eggs in the stools of patients who carry out defecation activities in open soil further increases the chances of transmitting worm larvae to surrounding communities. Notoatmodjo (2011) states that the role of feces in the spread of disease is very large. On the side can be direct contaminating food, drinks, vegetables, water, soil, insects (flies, cockroaches, etc.) and parts of the body can be contaminated by the stool.

This study also obtained as many as 42.3% of children who had bowel habits in the toilet both had worms. This can occur due to environmental sanitation factors as stated by Soedarto (2010), epidemiologically, there are several factors that influence the incidence of helminthiasis, namely environmental sanitation and human factors. In dealing with intestinal worms, supervision of water and food sanitation is very important, because the transmission of worms occurs through contaminated water and food. Environmental sanitation is an important thing that must be considered. To achieve life skills in the community, it must pay attention to clean water supply, toilet and bathroom management, and waste management. The researcher assumed that even though the child bowel habit was bad, it caused the child not to wash their hands with soap, so it was more likely to experience intestinal worms due to germs or eggs.

The worm is still stuck in the hand. This is in accordance with the theory Hendrik L. Blum cited by Notoatmodjo (2011) that efforts to prevent intestinal worms are always washing hands with soap after from the bathroom / toilet, always washing hands with soap after playing, before handling food, hookworm infection can be avoided by always wearing footwear, use disinfectant every day in the shower and defecation area.

#### **4.3 Relationship to Hand Washing with helminthiasis**

Children are most often attacked by worms because, usually their fingers are inserted into the mouth or eat without washing hands. Children must be accustomed to washing hands before eating so that worm larvae are not swallowed with food. The most common worms are roundworms, hookworms, tapeworms and pinworms (Ambarsari, 2012). The results showed that there were 62% of children with bad hand-washing habits who experienced intestinal worms while children with good hand-washing habits had 39.8% having worms. The statistical test results revealed that there was a relationship between habit of washing hands with helminthiasis in Taman Ria Elementary School 42 students in Wosi Village, Manokwari Regency and from the results of the prevalence ratio tests interpreted that poor hand washing habits tended to be 1,557 times compared to children who had habits good hand washing.

This is reinforced by Eryani's research (2013), that students infected with worms generally have a habit of washing hands that are lacking accompanied by long fingernails, so that worm eggs are often found in students' nails that are long and dirty. This is also stated by Bunda (2012), some prevention of intestinal infections is washing hands before and after eating or after using the toilet using soap (ordinary cleaning fluid is not enough), always maintain cleanliness and halal food to be consumed, make sure nails are always maintained and clean, cut if long, and not bite the nails, diligently bathing 2 times a day, make it a habit to routinely clean the house and bathroom, wash the food ingredients and clothes ironed after washing.

According to the Ministry of Health (2006) in Irawati (2013) also explained that roundworm eggs come out with feces in a damp place and are not exposed to sunlight, these eggs grow into infective. Roundworm infection occurs when an infective egg enters through the mouth with food or drinks and can also go through dirty hands

(contaminated with soil by worm eggs). From this study there were also children with good hand washing habits by washing hands before eating, after bowel movements and after playing on the ground but experiencing worms. This is because children are still infected even though they have washed their hands because they only wash their hands with water without using soap, so there are still germs that stick to the hands. There were also respondents who according to them later when they will eat their new staple food wash their hands while at the time of going to eat other than staple food which is snacks; they do not wash their hands first.

This is in accordance with the theory of Suzannita (2013) who said hand washing using water is a common practice throughout the world. But apparently this habit is less effective compared to hand washing using soap because the soap can shed fat and dirt containing germs. With correct use, all soaps have the same effectiveness in shed germs that cause disease.

#### **4.4 Relationship to Snacking with helminthiasis**

The results of the study showed that it was mostly snacks for students of Inpres 42 Taman Ria Elementary School in Wosi Village, Manokwari Regency, where bad children's snacking habits were 49.9%. Good snacking habits 51.1% buy snacks in a closed place like in a canteen while bad snacking habits are caused by children buying snacks in the open or on the roadside.

This can cause students to become infected with helminthiasis because they have a habit of buying snacks that do not meet the requirements. Students who tested positive for helminthiasis tended to buy snacks that were not closed and were in an environment that allowed transmission of worm eggs (Muchlisah, 2016).

Children with bad snacks are 62% having worms while with good snacks there are 39.5% experiencing worms. The statistical test results revealed that there was

a relationship between snack habits and helminthiasis in Taman Ria Elementary School 42 students in Wosi Village, Manokwari Regency and the results of the prevalence ratio tests interpreted that poor snacking habits tended to be 1,496 times compared to children who had snack habits well.

Research in line with what Muchlisah (2016) did for elementary school children at Athirah Bukit Baruga Makassar revealed the same thing that poor children's snacking habits caused children to become infected with helminthiasis. The results of the research at Taman Ria Elementary School 42 students in Wosi Village, Manokwari Regency who have good snacking habits infected with worms caused by hygiene behavior, in which children do not wash their hands before holding snacks consumed. The highest snacking habits in children while in the school environment and available at the SD Inpres 42 Taman Ria canteen, but there are no hand washing facilities such as sinks and availability of soapy water, this causes children to consume snacks without washing their hands and children who have good washing behavior hands in the bathroom are available with water, but do not have soap, so children who have good behavior can also be at risk of worms because washed hands are not clean or germs are not reduced by cleaning soap. Whereas in some children who do not suffer from helminthiasis, they will have behavior using paper or tissue provided by the teacher to consume snacks they eat. This needs attention from the school in order to provide sanitation hygiene facilities in the form of a sink and soap, so that children easily wash their hands before and after meals.

#### **5. CONCLUSION**

Based on the results of the discussion it can be concluded as follows:

1. There is no sex relationship with the incidence of helminthiasis in Taman Ria Elementary School 42 students in Wosi Village, Manokwari Regency (p-value

- 0.734; RP = 1.080; CI95% (0.793 - 1.472).
2. There is no tribal relationship with the incidence of helminthiasis in students of Taman Ria Elementary School 42 in Wosi Village, Manokwari Regency (p-value 1,000; Rp = 1,012; CI95% (0,740 - 1,385).
  3. There is a habitual defecation relationship with helminthiasis in Taman Ria Elementary School 42 students in Wosi Village, Manokwari Regency (p-value 0,000; RP = 2,081; CI95% (1,642 - 2,638).
  4. There is a relationship between the habit of washing hands and the incidence of helminthiasis in students of Inpres 42 Park Ria Elementary School in Wosi Village, Manokwari Regency (p-value 0.007; RP = 1.557; CI95% (1,154 - 2,100).
  5. There is a relationship between snacking habits and the incidence of helminthiasis in Taman Ria Elementary School 42 students in Wosi Village, Manokwari Regency (p-value 0.016; RP = 1.496; CI95% (1,093 - 2,046).
  6. There is a relationship between the habit of using footwear and the incidence of helminthiasis in students of SD 42 Inpres Taman Ria in Wosi Village, Manokwari Regency (p-value 0.004; RP = 1.603; CI95% (1,172 - 2,192)
  7. The dominant factor associated with helminthiasis in Taman Ria Elementary School 42 students in Wosi Village, Manokwari Regency is the habit of defecation, hand washing habits and the habit of playing on the ground.

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