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Description Of Children Behavior, Environmental Sanitation Conditions And Personal Hygiene And Helminthic Earthworms Diseases Incidence In School-Aged Children In Soligi Village, Obi- South Halmahera Islands, North Maluku Province

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ABSTRACT

Soligi village is a remote area located on Obi Island, North Maluku Province. Boats are the main transportation to reach this village. Soligi Village has poor public facilities and infrastructure, including health facilities. Based on information from midwife Rahma, who is the only available health worker in Soligi, 9 out of 10 children recorded in the case of earthworms (helminthic) disease is confirmed to have worms in their bodies. That means 90 percent of children are positive. Therefore, it is necessary to do study related to factors relating to the helminthic disease. This study was conducted in May 2015 with cross sectional and analytic descriptive methods. Of the 102 primary school-aged children as respondents, it showed that individual hygiene and environmental sanitation in school-aged children in Soligi Village were still very bad. Only 28.4% of children had a habit to wash their hands with soap and there were still many children who played outside the house in barefoot. A total of 64.7% of houses did not have SPAL and 60.8% did not have a latrine/toilet in their home. Habits of people drinking untreated water without boiling it first also became a causative factor of the increased helminthic disease in Soligi. It can be concluded that environmental sanitation is still below the standard, low education and poor individual hygiene. It is necessary to improve the public's knowledge related to environmental health, environmental sanitation and improved health behaviors to prevent helminthic disease. It also needs to improve adequate health facilities and additional medical workers.

INTRODUCTION

Helminthic or earthworms disease is an infectious disease that most commonly occurs in humans, especially in tropical and subtropical countries. Helminthic infection is transmitted by several species of worms through ground or what is often called Soil Transmitted Helminths (STH). Several major worms including roundworms (*Ascaris lumbricoides*), hookworms (*Ancylostoma duodenale* and *Necator americanus*) and whipworm (*Trichuris trichura*) have infected more than 1 billion people in the world, including at least 400 million school-aged children (World Health Organization, 1998). In Indonesia, the helminths prevalence is still high ranging between 60% -80% (Department of Health of the Republic of Indonesia, 2005). Hal ini It has something to do with socioeconomic status.

Soligi is a remote area located on Obi Island, North Maluku. Boats are the main transportation to reach this village with very expensive costs. Soligi village is divided into three hamlets with a population of 2,048 people

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(1,053 men and 995 women) and consists of 818 heads of households (Polindes Soligi Village, 2014). Helminthic disease in children incidence in Soligi Village is very high. Based on epidemiological investigations conducted by midwife Rahma, satu-satunya petugas kesehatan di Soligi, 9 dari who is the only available health worker in Soligi, 9 out of 10 children recorded in the case of helminthic disease is confirmed to have worms in their bodies. That means 90 percent of children are positive. This figure is still above the prevalence rate of helminthic infection in Indonesia, namely 60%-80% (Department of Health of the Republic of Indonesia, 2005).

Helminthic incidence in school-aged children is closely related to defecation behavior around the house, not washing hands before eating, playing on the ground in barefoot and earth eating habits (Minsitry of Health of the Republic of Indonesia, 2012). Some studies showed that the helminthic incidence was also related to environmental sanitation condition around the house, such as a sewer of feces, garbage disposal facilities and sewerage (Nur, M.I., *et al.*, 2013). Habits of children washing their hands after defecation and mothers' knowledge about helminthic infection also affect the helminthic incidence in children (Yudhastuti, R., and M.F. Lusno, 2012; Yuliati, Djajakusli, R. and B. Bahar, 2010; Rifdah, I., 2007; Isa, R., 2013).

Various helminthic disease control programs have been implemented in Indonesia, including starting of Helminthic in Children Eradication Programme launched by the Minister of Health Prof. DR. Sujudi in Medan in 1995. Today, the implementation of helminthic infection control activities in Indonesia, by Filariasis and Helminthiasis Subdit Directorate of Animal Sourced Disease focuses its target on primary school-aged children due to helminthic infection in this age group is the highest compared to other age groups. Short-term helminthic control program is conducted by reducing the prevalence of helminthic infections prevalence through treatment. Meanwhile long-term program is conducted continuously through community empowerment and the role of private sector, namely living a clean and healthy behavior, and improving the health of individuals and the environment (Minsitry of Health of the Republic of Indonesia, 2012).

Based on the data description above, researchers were interested in conducting study to see environmental sanitation and personal hygiene in the school-age children in Soligi to find out its relation to the helminthic incidence in Soligi Village, South Obi District, South Halmahera District, North Maluku Province.

Study Methods:

This study was descriptive analytic with cross-sectional study design. The study was conducted in Soligi Village, South Obi District, Obi Island, South Halmahera District, North Maluku Province. The study period was May 2015. The sample in this study was school-aged children of 6 to 12 years both boys and girls who lived in Soligi Village more than 1 year. The selection and sampling method is carried out by a systematic random sampling. The list of names of children used as the sampling frame was obtained from the list of households in Soligi Village and one sample of child represent one household. Based on the results of sample calculations, it was obtained the minimum number of samples of 92 school-aged children. To avoid drop out during data collection, this number was added 10% as backup so the number of sample was 101. With four individuals backup, the number of samples was rounded to 105.

Data was collected through interviews and environmental observation methods. Data collection tool uses questionnaires. Interviews were conducted to obtain data about the characteristics of respondents including age and gender, as well as individual hygiene including bathing habits, use of soap, tooth brushing habits, washing hands habits before eating and defecation habits (wash hands after defecation). Questions regarding the behavior of respondents were asked to parents of respondents who accompanied them to do interviews. Environmental observation was conducted to obtain data related to environmental sanitary home including the provision of clean water, toilet facilities, wastewater disposal (SPAL) and the availability of trash. Data analysis was conducted by univariate to get a description of the condition of home environmental sanitation and respondent individual hygiene.

RESULTS AND DISCUSSION

Sociodemographic characteristics in Soligi village:

Demographic data in Soligi Village was not obtained from the village office but from Polindes made by the midwife Rahma. According to the Midwif Rahma per May 21, 2015, Soligi village has a population of 2,065 inhabitants (of all ages), consisting of 559 Head of Households divided into 188 Head of Households in Hamlet 1, 146 Head of Households in Hamlet 2 and 225 Head of Households in Hamlet 3. Most of the population of Soligi were the descendants of Buton Tribe.

Soligi Village is situated on the south coast of Obi Island. The area is classified as a dry area (average temperature is 32 degrees Celsius) with quite low air humidity. Such a dry area condition is not a suitable place for the development of worm eggs. Thus, the helminthic incidence in Soligi is estimated through contaminated food and drinking water. In addition, based on the observation of children in Soligi, they are used to eating and drinking while playing in an open area.

Residents in Soligi Village are not ordinary fishermen who catch fish on the high seas but only fish on coast. This is evidenced by non finding of any big fishing boats. Most residents are actually farmers who garden far beyond Soligi Village settlements.



Fig. 1: The atmosphere during the sunny day with an open courtyard without vegetation in Soligi Village. (Photo was taken on May 22, 2015)

Although the village is a remote area without electricity from PT PLN, the level of economy in Soligi is quite good reflected from the ownership of household utensils. Almost every household has a solar panel and even a power generator to meet the needs of lighting at night. Some houses also own a television set. Based on the information, the harvest in Soligi can produce hundreds of tons of clove each season. This makes some families in Soligi capable of sending their children to college.

Respondents Characteristics:

Based on the results of the study, it is found the number of samples was less than 105, namely 102 respondents. The respondents characteristics in this study included age and gender. The frequency distribution of the respondents characteristics can be seen in Table 1.

Table 1: Frequency Distribution of school-aged children (6-12 years) characteristics in Soligi Village, South Obi District, South Halmahera District, North Maluku Province

Variable	n=102	%
<i>Age</i>		
6 years	7	6.9
7 years	13	12.7
8 years	16	15.7
9 years	16	15.7
10 years	16	15.7
11 years	20	19.6
12 years	14	13.7
<i>Gender</i>		
Boy	53	52
Girl	49	48

Remark:

n = number
% = percentage

Of the total respondents, it was obtained that the average age of respondents was 9 years old, and most gender were boys totaling 53 respondents (52%). Distribution by respondent's gender was almost the same among boys and girls aged- school children. Primary school-aged respondents were the age group most vulnerable to the helminthic infection compared to other age groups (Minsitry of Health of the Republic of Indonesia, 2012).

Individual Hygiene:

Data on individual hygiene, or more commonly known as Clean and Healthy Lifestyle (PHBS) of school-aged children in Soligi Village is shown in Table 2. The individual hygiene (PHBS) analyzed was (i) the frequency of bathing habit, (ii) the use of soap, (iii) the brushing teeth habit, (iv) washing hands before eating habit, and (v) defecation and washing hand habits.

Table 2: individual hygiene in school-aged children (6-12 years) in Soligi Village, South Obi District, South Halmahera District, North Maluku Province

Variable	n=102	%
Bathing habit :		
▪ 1 time/day	1	1
▪ 2 time/day	96	94.1
▪ 3 time/day	5	4.9

Use of soap :		
▪ Bar, individual	1	1
▪ Bar, sharing (together with other family members)	101	99
▪ Liquid, individual /sharing	0	0
Brushing teeth habit :		
▪ 1 time/day	31	30.4
▪ 2 time/day	66	64.7
▪ 3 time/day	5	4.9
washing hands before eating habit :		
▪ Yes, using soap	29	28.4
▪ Yes, without using soap	58	56.9
▪ No	0	0
▪ Sometimes	15	14.7
defecation and washing hand habits :		
▪ Yes, using water and soap	37	36.3
▪ Yes, using water without soap	65	63.7
▪ Yes, using tissue/other object	0	0

Remarks:

n = Number

% = percentage

The frequency of bathing habits of children in Soligi had been good with the proportion of 94.1% having twice a day bathing habit. Most of the children in Soligi Village were taking a bath while playing or looking for fish on the pier and the beach. The bathing habit regularly using soap can reduce the life cycle of worm attached to the human body.

Overall, individual hygiene (PHBS) of respondents was still bad when viewed from the habit of not washing hands using soap (as much as 56.9%) and defecation habit (washing hands after defecation) without using soap as much as 63.7%. Based on observation, most children in Soligi play outside in barefoot or without slippers. It can be seen from the following Figure 2.



Fig. 2: Children in Soligi playing outside the house in barefoot (Photo was taken on May 23, 2015)

This is also confirmed by Junaidi study (Junaidi, 2014) carried out on primary school students in the Community Health Center of Tapalang, Mamuju showing that washing hand and wearing footwear habits have a relationship with the helminthic infection incidence with p values of 0.002 and 0.017 each.

Although there are some studies that did not find a relationship between washing hand using soap with the helminthic infection incidence, such as Umar study (Umar, Z., 2008) in South Coast of West Sumatra District and Chadijah study (Chadijah, S., *et al.*, 2014) in primary schools in Palu City, but in theory washing hands using soap is capable of reducing or even eliminating worm eggs that stick in hand skin so it does not infect the children body. Washing hands using soap is also one of the eight indicators of PHBS that must be met in order to break the chain of the worm's life cycle (Minsitry of Health of the Republic of Indonesia, 2012).

Playing habits without using footwear will make the migration of worm eggs easier from the outdoor into the house. It is what increases the risk of environmental contamination in the house by worm eggs and make it easier to be ingested into the body through contact with food and beverages. The worms eggs can survive for several years in the soil with the optimum temperature of 25 to 30 degrees Celsius (Minsitry of Health of the Republic of Indonesia, 2012).

Residents in Soligi Village also have the habit of drinking raw water without boiling it. It can also increase the risk of helminthic infection incidence, given the water contaminated by worm eggs will make the life cycle of the worm easier to develop inside the human body when ingested directly (Greenaway, C., 2004).

Helminthic infection incidence reported in Soligi can be reduced or even eliminated altogether with the efforts of a clean and healthy living behavior. As is has been advised the Ministry of Health of the Republic of Indonesia (Minsitry of Health of the Republic of Indonesia, 2012), Helminthic infection incidence reported in

Soligi can be reduced or even eliminated altogether with the efforts of a clean and healthy living behavior. As is has been advised the Ministry of Health (Minsitry of Health of the Republic of Indonesia, 2012), namely by washing hands using soap at five critical times (after defecation, after cleaning a child who has defecation, before preparing food, before eating, after holding/touching animals), and managing food correctly.

Environmental Sanitation:

Environmental sanitation observation data in Soligi Village is presented in Table 3. Aspects of home environmental sanitation is observed: (i) a source of clean water, (ii) waste water sewerage availability (SPAL), (iii) latrines or toilets availability and (iv) trash bin availability.

Table 3: Home environmental sanitation in Soligi Village, South Obi District, South Halmahera District, North Maluku Province

Variable	n=102	%
Source of clean water :		
▪ Ground water	102	100
▪ Rain water	0	0
▪ PDAM	0	0
SPAL availability :		
▪ Yes, open	6	5.9
▪ Yes, open	30	29.4
▪ No	66	64.7
Type of latrine/toilet :		
▪ Yes, sitting, goose neck, <i>septic tank</i>	0	0
▪ Yes, squated, goose neck, <i>septic tank</i>	38	37.3
▪ Yes, <i>cubluk, septic tank</i>	0	0
▪ Yes, <i>cubluk, without septic tank</i>	2	2
▪ No latrines/toilets	62	60.8
Trash bin availability :		
▪ Yes, open	6	5.9
▪ Yes, open	1	1
▪ No	95	93.1

Remarks:

n = number
% = percentage



Fig. 3: Beachside location usually used by residents in Soligi to defecate at night (photo was taken on May 23, 2015).

Based on observation, the home environmental sanitation in Soligi Village was still relatively poor. A total of 64.7% of homes did not have SPAL, 60.8% did not have a latrine/toilet and 93.1% did not have a special trash bin in their houses. Household wastewater discharged without using SPAL will form moist areas on the ground around the house. Moist soil is very conducive to the breeding of infective worms (Minsitry of Health of the Republic of Indonesia, 2012).

The unavailability of latrines at home will also increase indiscriminate defecation behavior that will make the development of the worm's life cycle. Study conducted by Isa (Isa, R., 2013) showed a strong relationship (dominant) between the availability of latrines with the helminthic infection incidence (OR = 3.569) on primary school students of Jagabaya 1 Warunggunung Lebak Regency, Banten.

These results were in line with Yudhastuti and Lusno studies (Yudhastuti, R., and M.F. Lusno, 2012), which mentioned factors related to the helminthic infection incidence in children including the presence of latrine sanitation (OR = 5.245) and defecation habit at random (OR = 4.821). This study was conducted on children in Keputih Hamlet Sukolilo District, Surabaya. Another study was also described by Nur, Ane and Seloma (Nur, M.I., *et al.*, 2013) conducted in Barrang Lompo island of Makassar City, which indicated a stool disposal facility, garbage disposal facilities and wastewater sewerage which had a significant relationship with the helminthic infection incidence in primary school students in the area.

Sanitation is closely related to the reduced risk of the spread of worms to humans. Better increased environmental sanitation should be prioritized in addition to preventive using medicine and health promotion to reduce the helminthic infection incidence (Minsitry of Health of the Republic of Indonesia, 2012; Ziegelbauer, K., *et al.*, 2012). Bad environmental sanitation is not solely due to a lack of community awareness, but the presence of Soligi Village that is remote and difficult to reach become an obstacle for the people to access the environmental sanitation facilities.

Conclusions and Suggestions:

The results of this study indicated that individual hygiene and environmental sanitation in school-aged children in Soligi Village are still very bad. It can be seen from the lack of washing hands using soap, a habit of playing on the ground in barefoot and the unavailability of adequate SPAL, latrines and landfills. These factors can be estimated as the cause of helminthic infection incidence in school-aged children in Soligi.

Improving a habit of clean and healthy living behaviour of school-aged children is needed to be implemented by providing adequate knowledge to parents related to healthy living because parents are the main gate of the education of the child's behavior. Attention of local government related to environmental sanitation facilities in Soligi Village also needs to be improved.

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