



## Environmental Sanitation with the Incidence of Helmothermal Disease

Muslimin B<sup>1</sup>, Indrayadi<sup>2</sup>, Rini Susanti<sup>3</sup>, M.Khalid Fredy Saputra<sup>4</sup>, Elsa Yuniarti<sup>5</sup>, Haedir<sup>6</sup>, Yermi<sup>7</sup>, Israeli<sup>8</sup>

<sup>1</sup> Public Health Study Program, UPRI Makassar, Indonesia

<sup>2</sup> Nursing Study Program, Politeknik Kesdam VI Banjarmasin, Indonesia

<sup>3</sup> Hospital Administration Study Program, Akademi Kesehatan Kartini Batam, Indonesia

<sup>4</sup> Nursing Study Program, STIKES Baitul Hikmah, Indonesia

<sup>5</sup> Faculty of Mathematic and Natural Science, Universitas Negeri Padang, Indonesia

<sup>6</sup> Nursing Study Program, STIKES Datu Kamanre, Indonesia

<sup>7</sup> Public Health Study Program, UPRI Makassar, Indonesia

<sup>8</sup> Nursing Study Program, Universitas Mandalaya Waluya Kendari, Indonesia

### Abstract

Environmental sanitation of an environment consisting of sewage facilities, water supply facilities, garbage disposal facilities, and wastewater disposal facilities. And the sanitation must be owned by every housing that is maintained, clean and healthy, in order to prevent environmental pollution. This study was conducted with the aim to determine the relationship between environmental sanitation and the incidence of helminthiasis in elementary school children in the Barrang Lompo island area with a sample size of 143 children aged 5-10 years. The variables in this study were fecal disposal facilities (latrines), house floors, provision of trash bins, and clean water facilities as part of environmental sanitation. The method used was observational method with cross sectional study design. The results of this study were there was no relationship between latrine ownership and helminthiasis with a value of  $P = 0.077 > 0.05$ . There is a relationship between the floor of the house and the incidence of helminthiasis where the value of  $P = 0.000 < 0.005$ . There is a relationship between clean water facilities and the incidence of helminthiasis where  $P$  value =  $0.000 < 0.05$ . There is a relationship between waste disposal facilities and the incidence of helminthiasis where the  $P$  value =  $0.000 < 0.05$ . The conclusion shows that there is an association between helminthiasis in children aged 5-10 years with clean water facilities, house floors, and garbage disposal.

**Keywords:** Latrine Ownership, House Floor, Clean Water Facility, Garbage Disposal

Corresponding Author: Muslimin B

Email: [musimink2@gmail.com](mailto:musimink2@gmail.com)





## 1. Introduction

Environmental sanitation is an environment that consists of sewage facilities, water supply facilities, garbage disposal facilities and wastewater disposal. Sanitation must be owned by every housing and must be maintained, clean, and healthy, because this can prevent environmental pollution (Nugrahani, Raharjo, & Astorina, 2016). Helminth infection is the entry of worm eggs into the human body, especially in the digestive tract which can cause a disease, helminth infection is said to be positive if worm eggs are found in the feces examined (Kartini, 2016). In elementary school children, helminthiasis can cause a variety of disorders, such as: poor digestion. Metabolism of substances in food that are indispensable in the process of growth and development will have a direct impact on physical and mental growth. If the worms reach other important organs in the body such as the liver, brain, it can cause very serious problems and cause death due to severe infection (Prasetyo & Prasetyo, 2018). Environmental sanitation that does not meet health requirements and unhygienic living habits can cause the incidence of helminthiasis to continue to grow. Parasitic infections, especially helminth parasites, are a health concern. Helminth infections that are often found in Indonesia are Soil Transmitted Helminths (STH), which are transmitted through soil media. The species are: STH, namely *Ascaris lumbricoides* (roundworm), *Trichuris tricur*a (whipworm), *Ancylostoma duodenale* (hookworm) (Gandahusada, Iahude, & Pribadi, 2000). The largest distribution is in rural areas in several regions of Indonesia and shows the prevalence of helminthiasis found in all age groups, but the highest in elementary school children with an age range of 5-14 years, namely 90-100% (Marleta, Harijani, & Marwoto, 2005).

Based on data from the World Health Organization (WHO) in 2006, an estimated one billion people were infected with *Ascaris Lumbricoides* worms, 795 million people were infected with *Trichuris Triciura* worms, and 740 million people were infected with Hookwan worms (World Health Organization, 2006). In Indonesia, helminthiasis still has a high prevalence, especially in areas with poor sanitation. In 2002-2009, DG PP&PL conducted fecal examinations of elementary school children in 33 provinces and showed an average worm prevalence of 31.8%. A survey conducted in 10 districts in 2012 found that the highest prevalence of worms came from Gunung Mas district in Central Kalimantan Province (76.67%). In Banten Province, worm infection was highest in Lebak (62%) and Pandeglang (43.78%) districts (DG PP&PL, 2013).

It is known that the prevalence of worm infection in Indonesia in 2015 reached 28.12%, but this figure does not reflect the actual conditions because there are still many areas in Indonesia that have not been covered by worm infection testing (DHO, 2015). Data from the





Makassar City Health Office for the last three years, especially in 2019 at the age of < 1 year and > 45 years, the number of helminthiasis cases in men was 808 people and in women as many as 887 people with suspected (clinical) as many as 1,202 people and positive Lab as many as 199 people. The location with the highest prevalence of helminthiasis is in the working area of the Barrang Lompo Island Health Center (Makassar City Health Office, 2019). This island is one of the small islands located in Ujung Tanah sub-district, to the northwest, and to the north of Barrang Caddi island. It has a distance of 11 km from Makassar. The environmental conditions are still fairly slum, because most of the population still has the habit of defecating on the edge of the sea. Poor hygiene and sanitation are conditions that greatly influence the onset of helminthiasis infection (Prasetyo & Prasetyo, 2018).

## 2. Research Method

This study used observational research with a cross sectional study design to see the relationship between environmental sanitation and the incidence of helminthiasis in elementary school children. The population in this study were all children aged 5-10 years in the Barrang Lompo Island area. Samples in the study were students who were selected as samples. Sampling was done by simple random sampling, where primary data was collected by conducting interviews and observations in the Barrang Lompo Island area, Ujung Tanah Subdistrict, Makassar City. Then, secondary data were obtained from relevant agencies related to the object of research. Data processing was carried out using the SPSS program, such as: editing, coding, data entry, and finally checking the data to see the possibility of code errors, incomplete data, and so on.

## 3. Results And Discussions

### a. Result

If the results of data processing show a p value <  $\alpha$  (0.05), then  $H_0$  is rejected, meaning  $H_a$  is accepted. This means that there is a relationship between the independent variable and the dependent variable. The data that has been analyzed is then presented in the form of tables and narratives. The data that has been analyzed is then presented in tabular form accompanied by a narrative as an explanation.

From the results of research conducted with a total of 143 respondents consisting of 86 people (60%) male and 57 people (40%) female, most of the respondents were aged 8-9 years or as many as 35 people (24.5%).

### b. Discussion

#### 1) Description of the incidence of helminthiasis





The results showed that most respondents in the Barrang Lompo Island area did not have helminthiasis, namely 103 people (72.1%) compared to 40 people (27.9%) with helminthiasis. The types of worms in respondents with helminthiasis totaling 40 people were distributed with most of them with roundworms, namely 20 people (50%) and the least was hookworm, namely 8 people (20%). The incidence of helminthiasis with roundworms is more than other types of worms in accordance with the living habits of roundworm eggs which can live longer and withstand the effects of bad weather compared to other types of worms.

## 2) Relationship between latrines and helminthiasis incidence

The requirement for a healthy latrine is that the latrine must have walls and a door so that the person inside is not visible. The latrine should have a roof for rain and heat protection, where light can enter the latrine, because sunlight is useful for killing germs, and the floor should be made of impermeable materials such as: cement or boards that are arranged tightly. This is necessary so that dirty water cannot seep into the ground and the floor is easy to clean. The latrine should have sufficient ventilation for air exchange to keep the air inside the latrine fresh. The pit should be located between 10-15 meters from a clean water source so that the water source is not polluted, and clean water and soap should be available inside the latrine to clean yourself. For pour-flush latrines, the pit should have a tight lid so that flies, cockroaches, and other insects cannot enter and exit the pit. The foul water flow hole on the floor should be lower than the pit of the latrine, and the latrine should not be built in a place that is flooded with water. Ownership of a latrine in this study is the ownership of a building for hygienic defecation and urination that includes walls, doors, roofs, lighting, and floors of impermeable materials. After conducting the Chi Square Test with Continuity Correction, the P value = 0.077 was obtained, because the P value > 0.05 which means  $H_0$  is accepted. There is no significant relationship between family latrines and helminthiasis infection in children aged 5-10 years. The results showed that many respondents had defecated in latrines and no longer defecated in the sea. This was shown by 141 respondents (98.6%) who were not infected with helminthiasis. Cleanliness and environmental health (sanitation) that can be done to prevent the spread and proliferation of worm eggs is by disposing of water in latrines in the right place. This is in line with research conducted by Ginting (2009) where the results obtained showed that there was no significant relationship between latrine ownership and the incidence of disease in primary school-age children (5-10 years) in the Barrang Lompo Island area.





### 3) Relationship between house floor and helminthiasis incidence

In this study, the hygienic floor of the house means the floor of the house made of tiles or plaster. After conducting the Chi Square Test with Contunity Correction, the value of  $P = 0.000$  was obtained. Because the value of  $P < 0.05$  means  $H_0$  is rejected, where there is a significant relationship between the floor of the house with the incidence of helminthiasis infection in children aged 5-10 years in the Barrang Lompo Island area. The results showed that there is a relationship between the floor of the house and the incidence of helminthiasis because the type of floor used by respondents is still not qualified, which is made of soil and partly made of wood. Given that most people have wooden houses and dirt floors. This is related to the incidence of helminthiasis because the floor of the house made of soil will be a place for worm eggs to hatch, where worm eggs hatch on soil media. This study is in line with research conducted by Silvia Altiara in RW. 03 Kelurahan Panggung Kota Tegal in 2016 which found that there was a relationship between floor type and the incidence of helminthiasis.

### 4) Relationship between clean water availability and helminthiasis incidence

The sign of clean water is that it can be physically distinguished through our senses, including being seen, felt, smelled, and touched. Water must not be colored and must be clear until the bottom of the water container is visible. It should not be cloudy and should be free from sand, dust, mud, garbage, foam and other impurities. The water must also be free from household chemicals such as foul odor, sulfur odor, and the water must match the surrounding temperature or lower, not higher. Clean water availability is availability that can be used for human activities including colorless, tasteless and odorless water. After the Chi Square Test with Contunity Correction, the  $P$  value = 0.000, then the  $P$  value  $< 0.05$  which means  $H_0$  is rejected, where there is a significant relationship between the availability of clean water and the incidence of helminthiasis infection in children aged 5-10 years in the Barrang Lompo Island area. Statistical test results show that there is a relationship between source conditions and helminthiasis. This indicates that the quality of water consumed is very important to be considered, such as quality aspects (water should meet physical, chemical and bacteriological requirements), and the distance between clean water sources and pollutants must be considered. This study is in line with Marhadi (2008) in Purinaro Village who showed a relationship between clean water supply and helminthiasis infection. Water that does not meet quality and quantity requirements is more likely to be infected with worms.





#### 5) Relationship between waste disposal facilities and helminthiasis

Waste that is not managed properly can affect health, one of which is a place for worms to live and can be harmful to health. After the Chi Square Test with Contunity Correction, the value of  $P = 0.000$  was obtained, because the value of  $P < 0.05$  means  $H_0$  is rejected, where there is a significant relationship between means of garbage disposal with the incidence of helminthiasis infection in children aged 5-10 years in the Barrang Lompo Island area. The results of the statistical analysis showed that there is a relationship between the means of garbage disposal and helminthiasis infection. This situation is assumed because most people dispose of their waste in temporary shelters located on the side of the road and without a cover (not watertight) which causes unpleasant odors and can be inhabited by flies. This study is in line with a study conducted by Masnah (2002) in Cenrana village, where a stochastic test showed that there was a relationship between means of garbage disposal and helminthiasis infection in elementary school children in Cenrana village.

#### 4. Conclusion

The results of the study on the incidence of helminthiasis in elementary school children (5-10 years old) in the Barrang Lompo Island area are as follows:

1. There is no association between latrine ownership and helminthiasis in Barrang Lompo Island with  $P = 0.077 > 0.05$ .
2. There is a relationship between the floor of the house with the disease with a value of  $P = 0.000 < 0.05$ .
3. There is a relationship between clean water facilities and disease with a value of  $P = 0.000 < 0.05$ .
4. There is a relationship between waste disposal facilities and helminthiasis with a  $P$  value =  $0.000 < 0.05$ .

#### 5. Compliance with ethical standards

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##### Disclosure of conflict of interest





This research collaboration is a positive thing for all researchers so that conflicts, problems and others are absolutely no problem for all writers.

### Statement of informed consent

Every action we take as authors is a mutual agreement or consent.

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