Risk of Environment-Based Disease Events in Lumu-Lumu Island

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Abstract. Island health problems are a very important issue to be revealed on the surface. Lumu-Lumu island is one of the small islands located 27.54 km from Makassar city. Its remote area that do not reached yet by regular sea transportation situated this island as vulnerable to environmental health risks. This study aims to determine the condition of environmental sanitation of the people of Lumu-Lumu Island, Makassar city. The research design used descriptive with a spatial approach. The study population was 224 households and 55 households were selected through simple random sampling. The results showed that the conditions of the waste around the environment attracted many mosquitoes (56.4%), ownership of latrines (58.2%) and the place for distribution of final waste feces to the sea (54.5%). The source of drinking water and clean water for cooking used was tap water from PDAM/Project/HIPPAM, respectively, 43.6% and 49.1%. Meanwhile, the households used water from wells dug protected for washing dishes and glasses (69.1%) and for brushing teeth (61.8%). Respondents treated water before drinking and cooking (61.8%). This study concludes that the majority of respondents have latrines. The most widely use of source of clean water for cooking and drinking is water from clean water treatment equipment while for washing dishes and toothbrushes they use well dug protected. The majority of respondents have treated clean water before being minimized and cooked.

Keywords: Foot Arch Type, Energy Expenditure, Walking, Oxygen Consumption.

1 Introduction

Island health problems are a very important issue to be revealed on the surface. Matters relating to things such as clean water, global sanitation, solid waste, community behavior, cleanliness, health services, infectious diseases such as malaria are proven to occur on several islands in Indonesia [1]. Health professionals such as doctors, midwives, nurses, paramedics, public health, health, and other paramedics still think a thousand times to be employed in the island region. Medan is far and heavy with the absence of facilities and facilities, making the island area the last alternative for the health profession [2].

Poor environmental health conditions in island communities seem to be characteristic of islands and coastal areas. Data from the Makassar City Health Office shows that diseases related to environmental factors still dominate the small islands (ARI, diarrhea, and various types of skin diseases). Whereas especially in Barang Lompo Island, the number of diarrheal

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diseases in 2013 was 199 people, in 2014, there were 187 people, and in 2015, there were 199 people [3]. One of the factors causing infectious diseases was poor public health.

In addition to environmental sanitation research as the most dominant factor in the occurrence of environmental-based diseases, early research has also been conducted on the behavior of public health hygiene and health care workers in the islands. The results show a significant relationship between these conditions and environmental-based diseases on the small island of Kota Makkasar [4].

Lumu-Lumu Island is one of the small islands, which is 27.54 km from the City of Makassar. Its remote location and not yet reached by regular sea transportation makes this island vulnerable to environmental health risks. The dense population causes a lot of environmental health problems on this island. The priority of environmental problems in coastal areas and small islands such as Lumu-Lumu Island is a balance between the number of residents and natural resources, which can be a serious problem in the future [5].

The hazards arising from environmental problems and hygiene risk factors as well as unhygienic or risky behavior accounted for 19% of deaths in the world due to infectious diseases. Environmental health problems in Indonesia, in this case, the sanitation facilities of small islands are still very alarming, which is marked by the high incidence of infectious diseases and infectious diseases in the community [6]. Mukherjee said that the prevalence of diseases due to poor sanitation in Indonesia is diarrheal diseases as big as 72%, 0.85% helminthiasis, 23% scabies, 0.14% trachoma, 0.57% hepatitis A, 0.02% hepatitis E and 2.5% malnutrition [7].

2 Material and Methods

The research design used is research with a spatial approach. The research was carried out on Lumu-lumu Island, Makassar City in September - October 2018. The study population was 224 households in Lumu-Lumu Island. Sampling using simple random sampling with a sample size of 55 households. The analysis process is carried out using a data analysis program that is available in the SPSS program. Data that has been processed and analyzed is presented in the form of a simple table/frequency table for univariate analysis accompanied by a narrative or explanation of the variables under study.

3 Results

The number of respondents in this case Lumu-lumu Island community based on the highest age group is 31-40 years, namely as many as 18 people with a percentage of 32.7%, while the number of respondents based on the highest level of education is elementary school numbering 40 people with a percentage of 72.7% and the lowest is the level of vocational education and universities with a percentage of 1.8% (Table.1).

Table 1. Distribution of Characteristics of Respondents in the Community of Lumu-Lumu Island, Ujung Tanah District, Makassar City 2018

Characteristics of Respondents	Total	
	n	%
Age group		
≤ 20	2	3.6
21 - 30	16	29.1
31 - 40	18	32.7
41 - 50	16	29.1
51 - 60	2	3.6
≥ 61	1	1.8
Level of education		
Not Formal School	7	12.7
Elementary School	40	72.7
Junior High School	4	7.3
High School	2	3.6
Vocational School	1	1.8
University / Academic	1	1.8
Total	55	100.0

The condition of household waste in Lumu-Lumu Island, Ujung Tanah Sub-District, Makassar City, the highest percentage is the condition of garbage around the environment which has mosquitoes of 56.4%, and the lowest is the condition of garbage in an environment that has never been visited by cats and dogs and never drainage blockage occurs with a percentage of 0%. The method for managing household waste in Lumu-Lumu Island 100% of respondents dispose of household waste in the sea (Table.2).

Table 2. Distribution of Respondents Based on Household Waste Conditions in Lumu-Lumu Island Ujung Tanah District, Makassar City

Household Waste Conditions		Total	
		n	%
Lots of garbage is scattered or piled up around the environment	Yes	24	43,6
	No	31	56,4
Lots of flies around the garbage pile	Yes	20	36,4
	No	35	63,6
Many mice roam	Yes	6	10,9
	No	49	89,1
Many mosquitoes	Yes	31	56,4
	No	24	43,6
Many cats and dogs come to rubbish heaps	Yes	0	0
	No	55	100,0
A nasty stench	Yes	8	14,5
	No	47	85,5
Clogging the drainage canal	Yes	0	0
	No	55	100,0
Children are playing around it	Yes	12	21,8
	No	43	78,2
How to process household waste	Thrown	55	100,0

	into rivers / times / sea / lake		
Total		55	100,0

Source: Primary Data, 2018

The majority of respondents, in this case, the people of Lumu-Lumu Island have latrines with a percentage of 58.2%, but where the final discharge of feces of the majority of the people in the sea is 54.5% (Table.3). The source of drinking water used by most respondents is Air Ledeng from PDAM / Project / HIPPAM with a percentage of 43.6%. While the majority of the sources of clean water used for cooking, namely Air Ledeng from PDAM / Project / HIPPAM with a percentage of 49.1%, are used for washing dishes and glasses, namely water from dug wells protected by a percentage of 69.1%, and clean water sources used to brush teeth also from well water dug protected with a percentage of 61.8% (Table.4). The method of processing drinking water in respondents on Lumu-Lumu Island as much as 61.8% treated the water first before being used for drinking and cooking (Table.5).

Table 3. Distribution of Respondents Based on Latrine Ownership on Lumu-Lumu Island, Makassar City 2018

Latrine Ownership		**Total**	
		n	**%**
Latrine Ownership	Yes	32	58,2
	No	23	41,8
Stool final disposal site	Septic Tank	25	45,5
	Rivers/lake/Beach/Sea	30	54,5
Total		**55**	**100**

Table 4. Distribution of Respondents by Source of Clean Water and Drinking Water on Lumu-Lumu Island, Ujung Tanah District, Makassar City 2018

Source of drinking water and clean water		**Total**	
		n	**%**
Source of drinking water and clean water	**Source of Drinking Water**		
	Bottled water packaging	20	36.4
	Refill water - buy from the seller of refill water	3	5.5
	Tap water from PDAM / Project / HIPPAM	24	43.6
	Water from public hydrants-PDAM / HIPPAM / Project	7	12.7
	others	1	1.8
	Source of Clean Water is used by for Cooking		
	Bottled water packaging	1	1.8
	Refill water - buy from the seller of refill water	2	3.6
	Tap water from PDAM / Project / HIPPAM	27	49.1
	Water from public hydrants-PDAM / HIPPAM / Project	18	32.7
	Rainwater (PAH / Rainwater Shelter)	1	1.8
	Others	6	10.9
	Clean water sources are used by washing dishes and washing glasses		
	Water from wells is protected	38	69.1

	Water from dug wells is unprotected	17	30.9
	Clean water sources are used toothbrushes		
	Water from PDAM / Projection / HIPPAM	4	7.3
	Water from PDAM / HIPPAM / Project public hydrants	2	3.6
	Water from wells is protected	34	61.8
	Water from dug wells is not protected	15	27.3
Total		55	100,0

Table 5. Distribution of Respondents by Way of Drinking Water Treatment on Lumu-Lumu Island, Ujung Tanah District, Makassar City 2018

Drinking Water Treatment		**Total**	
		n	**%**
The behavior of water treatment before being drunk and cooked	Yes	34	61.8
	No	21	38.2
Total		55	100,0%

4. Discussion

The education level of the head of the family in Lumu-lumu Island is mostly graduated from elementary school. This is in line with the results of research conducted by Imroatus et al. the last most respondents were elementary school graduates, as many as 74 people (60.2%) [8]. Education is very important, which is very difficult for students to know the level of education that can increase knowledge about health [9]. Education will provide information about what is needed, which is more important for more effective actions, and more than health problems and better health status [10].

The problem of waste is the most common problem, especially in small islands, this is caused by the lack of facilities or infrastructure for garbage transportation, this also occurs in Lumu-Lumu Island, Ujung Tanah District, Makassar City. All respondents said that the sea was the final dumping place for their household waste, even though this method could cause health risks. Respondents with poor waste management have a risk of 3.3 times experiencing diarrhea in children under five compared to good waste management [11]. To reduce the burden of waste, it is very important to do waste management at the household level. Reducing the volume of waste can be achieved by sorting waste into the wet/kitchen/organic waste and dry/inorganic waste and doing something about the results of the waste. Waste that is thrown away will easily pollute the environment and endanger the community. Thus, the risk of pollution and the spread of disease vectors due to waste will be higher both seawater pollution and specific water bodies used by households [12].

The latrine is an important part of environmental health. Various Extraordinary Events (KLB) that have occurred were caused by basic sanitation that did not support, especially in the use of latrines. Respondents who do not have latrines on Lumu-Lumu Island usually defecate in the neighbors' toilets or their immediate families, but there are still many respondents who do defecation in the sea, this is supported by Halim research on the condition of environmental sanitation in coastal communities which shows that respondents who do not have latrines dispose of their fist in the pond or on the seafront [13]. A similar study was also carried out by Adisasmito, who said that people who did not have toilet facilities risked 17.25 times diarrhea in infants and toddlers [14].

Availability of clean water and adequate drinking water with good quality is always associated with basic human sanitation conditions. Research conducted on Lumu-Lumu Island, Ujung Tanah Sub-district, Makassar City shows that the majority of people on Lumu-Lumu Island use water produced from clean water treatment equipment, which is assistance from the Makassar City Public Works Service as a source of drinking water and clean water for cooking with a percentage of 43.6% and 49.1%. Whereas for dishwashing and toothbrush needs, the majority of respondents used well-dug water protected with a percentage of 69.1% and 61.8%, this was due to the limited availability of clean water treatment equipment on Lumu-Lumu Island.

This study also showed that there were still 38.2% of respondents who did not do drinking water treatment whereas such behavior can cause health risks for people, who drink it due to the content of drinking water that does not meet the requirements and may have been contaminated by microorganisms. One disease caused by drinking water whose microbiological quality is poor is diarrhea [15], [16].

5. Conclusion

This study concluded that the condition of respondents' household waste was the highest, namely the number of mosquitoes around the garbage pile. More privately owned latrines have but some of the final disposal sites in the sea. The most widely used source of clean water for cooking and drinking purposes is water produced from clean water treatment equipment, while for washing dishes and toothbrushes, most respondents use well water that is protected. The majority of respondents treat clean water before it is minimized and cooked. It is expected that the Public Works Office of Makassar City will add clean water treatment equipment on Lumu-Lumu Island so that all people can obtain and use good quality clean water easily.

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