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Environmental Health Overview on Amaliun Street, Medan Area

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ABSTRACT

This research aims to explore behavioral patterns and environmental conditions of households related to waste management, sanitation and cleanliness in a community. The research method was carried out using a questionnaire which was distributed directly to households, asking about activities such as waste disposal, sanitation of toddler feces, organic waste management, and disease prevention practices such as fighting mosquito bites. Apart from that, the questionnaire also evaluates the condition of the bedroom, kitchen, family room, and the main water source used. The research results show that although most households have systems for collecting waste water and adequate sanitation, there is still a tendency to dispose of waste directly into sewers or rivers. Even though the majority of households have a closed waste collection system, there are also those who still use open areas. Waste management is generally carried out by transporting it by officers or burning it, although there are still those who throw it in prohibited places. Prevention of diseases transmitted through mosquito bites is generally done by using anti-mosquito medication and regularly draining water reservoirs. Ventilation and lighting conditions in the house vary, but most are considered adequate. The majority of households rely on refillable water and drilled wells as the main water source, with an average water consumption of between 200 and 350 liters per day. This research provides a clear picture of household habits and environmental conditions, which is an important basis for developing sanitation and environmental improvement programs in the communities concerned.

Keywords: *Sanitation, Waste management, Household.*

1. INTRODUCTION

Environmental health is an effort to achieve healthy environmental conditions in physical, chemical, biological, and social aspects, in accordance with Law Number 36 of 2009 concerning Health. This is achieved through health measures, security, and control of various environments such as residential areas,

workplaces, recreational areas, and public facilities, as stipulated in Government Regulation No. 66 of 2014.

The health of an individual or community is influenced by various internal and external factors. Internal factors encompass the physical and psychological aspects of the individual, while external factors involve various things such as the social, cultural, physical, political, economic, and educational contexts. In general, health status is influenced by four main factors: the environment, lifestyle or behavior, health services, and genetic or hereditary factors.

The environment has a significant influence on human health, as explained in the concept of the Epidemiological Triad or Ecological Triad. This concept states that the interaction between disease agents, humans, and the environment must be balanced to maintain health. Disruption of any of these components, particularly the environment, can facilitate the entry of disease agents into the human body, which can result in disease.

Environmental health also involves complex interactions between environmental components that have the potential to cause disease and various demographic variables such as behavior, education, and age. Sources of disease serve as points that continuously release or emit disease agents, which can cause health problems through direct contact or through intermediaries such as air, water, soil or food, animals or insects, and humans.

Therefore, efforts to maintain environmental health are key to preventing environmentally-based diseases and ensuring environmental conditions that support optimal health for individuals and communities. Environmental cleanliness and the health of public places need to be maintained because many people gather there for various activities, increasing contact between individuals and the potential for disease transmission, both directly and indirectly, through intermediaries such as objects or tools used. Public places are areas where many people gather for activities, whether incidental or widely used by the community (Suparlan, 1998).

Furthermore, the physical condition of a home also influences the spread of disease. A home's physical environment that does not meet standards has a significant potential to cause disease. Factors such as inadequate ventilation, high humidity levels, and lack of lighting can affect the health of occupants. An unhealthy house can theoretically be a source of various diseases, especially if it is not equipped with good ventilation to prevent the entry of mosquitoes that can bite humans into the house (Wijirahayu, Sucinah et al., 2019).

2. RESEARCH METHOD

This study adopted a qualitative approach. The research method involved the use of questionnaires and field research. Questionnaires are a common technique

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in survey studies, involving the development of a list of written questions for respondents to answer, allowing for the collection of quantitative data on their behaviors, opinions, and characteristics. Field research refers to collecting data directly from respondents through face-to-face interviews or direct distribution of questionnaires.

The steps in using this method include careful questionnaire planning by selecting appropriate question types (both open-ended and closed-ended), testing for validity and reliability, and systematic survey implementation. Once the data is collected, statistical analysis can be conducted to identify patterns or trends in the data (Babbie, E 2016).

The advantage of this method lies in its ability to collect large amounts of data efficiently. Questionnaires can be distributed to a representative number of respondents in a short period of time, allowing for the collection of significant quantitative data. However, the use of questionnaires has limitations in gaining an in-depth understanding of the context or factors influencing respondents' responses. To address this, field research is essential. By going into the field, researchers can make direct observations, interact with respondents, and conduct in-depth interviews, thereby gaining a deeper understanding of the context in which questionnaire data was collected.

3. RESULT AND ANALYSIS

Questionnaire average answers to interview results

Below is a questionnaire table along with the average answers from the informants/community.

Table 1. List of main wastewater discharges from bathroom/laundry & kitchen

No.	Variables	Amount	%
1.	**Where is the main wastewater disposal point from the bathroom/laundry & kitchen?**		
	a. Bathroom/Washroom		
	Closed storage	19	38%
	Open storage	10	20%
	No storage (on the ground)	3	6%
	Directly to the drain	18	36%
	b. Kitchen		
	Closed storage	24	48%
	Open storage	5	10%
	No storage (on the ground)	2	4%
	Directly to the drain	19	38%

Based on the results of Table 1, the main wastewater disposal from the bathroom/washing area & kitchen, it can be seen that around 58% of people have a reservoir either in the bathroom or in the kitchen, and 74% go directly to the gutter and 10% do not have a reservoir.

2.	**For households with toddlers, how do you dispose of toddler feces?**		
	Using a toilet	7	14%
	Disposing of waste in any place	3	6%
	No toddlers	40	80%

Table 2. How to dispose of toddler feces, it can be seen that most residents on Jln. Amaliun, Medan Area District, have few toddlers, 80% do not have toddlers in their homes and only 20% have toddlers, of which 14% use latrines and 6% dispose of them carelessly.

3.	**What type of place is used to collect/storage wet (organic) waste in the house?**		
	Closed trash can	29	58%
	Open trash can	21	42%

Table 3 Types of places for collecting/storing wet (organic) waste in the home, of the 50 people we surveyed, 58% of them have closed trash cans while the remaining 42% have open trash cans.

4.	**What are the main ways to handle household waste?**		
	Transported by officers	22	44%
	Throw it away in the landfill	13	26%
	Burned	13	26%
	Thrown into the river	2	4%

Table 4. The main way of handling household waste, from the data we reviewed, it is dominant that 44% of people use garbage collection services and 26% of people throw it directly to the TPS, as well as 26% by burning it and only 4% throw it into the river.

5.	**What do households usually do to prevent the spread of disease due to mosquito bites?**		
	Using mosquito repellent	44	88%
	Sprinkle larvicidal powder in water containers	2	4%
	Install mosquito netting on vents	29	58%
	Drain the bathtub/large bucket/drum	48	96%
	Cover water containers in the household	21	42%
	Destroy used items	43	86%

Table 5. What households usually do to prevent the transmission of diseases caused by mosquito bites. Of the 50 people we asked, almost the majority, above 50%, carried out the actions in the questionnaire provided, except for sprinkling larvicide, which was only carried out by 4% of people.

6.	**How many times does a household empty the tub/bath bucket/drum?**		
	> 1 time 1 week	15	30%
	Once a week	23	46%
	1-3 times a month	12	24%

Table 6 Households draining tubs/bath buckets/drums, from what we reviewed, there are around 46% of people who do it only once a week, then there are 30% who do it less than once a week and 24% who do it 1 to 3 times a month.

7.	**Condition of the rooms in the house.**

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	a. Master bedroom		
	1. Window		
	Yes, open daily	25	50%
	Yes, rarely open	15	30%
	No	10	20%
	2. Ventilation		
	There is an area >=10% of the floor area	28	56%
	There is an area <10% of the floor area	18	36%
	None	4	8%
	3. Light		
	Enough	35	70%
	Not enough	15	30%
	b. Kitchen/Cooking		
	1. Window		
	Yes, open daily	23	46%
	Yes, rarely open	20	40%
	No	7	14%
	2. Ventilation		
	There is an area >=10% of the floor area	19	38%
	There is an area <10% of the floor area	26	52%
	None	5	10%
	3. Light		
	Enough	36	72%
	Not enough	14	28%
	C. Family room		
	1. Window		
	Yes, open daily	37	74%
	Yes, rarely open	9	18%
	No	4	8%
	2. Ventilation		
	There is an area >=10% of the floor area	26	52%
	There is an area <10% of the floor area	20	40%
	None	4	8%
	3. Light		
	Enough	45	90%
	Not enough	5	10%

Table.7 Condition of the room in the house, from what we have data about half of the 50 people have windows that are opened every day in 3 existing rooms, namely the bedroom, kitchen and also the family room, which also has ventilation of more than 10% of the floor in the bedroom, namely about 56%, the kitchen 38% and the family room 52% which shows that the three rooms are already well ventilated for air to enter and exit the house except in the kitchen. Then the lighting is very sufficient in the three rooms, namely 70% of them have sufficient lighting in the room.

8.	**What is the main type of water source used by households for drinking purposes?**		
	Branded bottled water	8	16%
	Pdam tap water	1	2%
	Refillable water	32	64%
	Pumped boreholes	8	16%
	Protected dug wells	1	2%

Table 8. The main type of water facility used by households for drinking purposes, most of them use refilled water for drinking purposes, namely around 64% of 50 people and 16% use branded water as well as pumped well water and only 2% use PDAM tap water.

9.	**What is the main type of water source used by the household for cooking, personal hygiene and washing (clothes and cooking/eating utensils)?**		
	Refill water	1	2%
	Plumbing water/PDAM	21	42%
	Borehole well/pump	22	44%
	Protected dug well	6	12%

Table 9 The main type of water source used by households for cooking, personal hygiene and washing (clothes and cooking/eating utensils), mostly using pumped drilled wells, namely 44%, then there is tap water or PDAM 42% and only 12% for protected dug well water and 2% for refill water.

10.	**How much water is used (in liters) for drinking, cooking, bathing and washing (clothes and cooking/eating utensils) for all household members in a day and night?**
	Average 200-350 liters

Table.10 Amount of water used (in liters) for drinking, cooking, bathing and washing (clothes and cooking/eating utensils) for all household members in a day and night. The average water used by the 50 people we asked was around 200-350 liters used in one day and one night.

Closed Wastewater Disposal

Closed Wastewater Treatment Disposal of wastewater that is hazardous to health or does not meet health standards can contaminate the surface of the ground and water sources. To prevent or reduce environmental pollution from wastewater, it is necessary to dispose of wastewater properly so that it does not become a breeding ground for pathogens such as flies, does not contaminate water sources or soil, and does not produce odors. Wastewater treatment systems are designed to prevent water from pooling around your home, ensuring that the area around your home does not become a breeding ground for insects or pollute the environment or water sources. Domestic wastewater includes water used for bathing, washing, furniture, food, and so on. This water contains a lot of soap, detergent, and microorganisms. Wastewater containing human feces and urine is also produced. The best effort to prevent the transmission of diarrheal diseases is

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to build a closed wastewater treatment plant (SPAL) and maintain the wastewater treatment plant (SPAL) always disinfected to prevent the formation of pools of water and become a vector for diarrheal disease transmission (Rangit, Lintang, Sekhar, 2016).

Disposal of toddler feces

Disposal of infant feces: A healthy toilet is an effective means of disposing of feces to break the chain of disease transmission. A healthy toilet is an effective means of disposing of feces for infants, and maternal behavior can prevent diarrhea in infants. Research concludes that there is a significant relationship between toilet conditions and silent incidents. These results align with the Ministry of Health's (1999) statement that E. coli bacterial contamination occurs in drilled wells. Bacteria in human feces can spread up to 11 meters horizontally and up to 3 meters vertically. According to the Indonesian Ministry of Health (2007), diarrhea-causing bacteria are usually spread through the fecal or oral route, such as through food or drink contaminated with feces and/or direct contact with the feces of an infected person (Puspitasari, Anna Dian et al., 2015).

Types of Closed Organic Waste Storage

Types of Closed Organic Waste Storage Waste disposal or pollutant flows also pose growing environmental and economic problems in two ways: First, waste contains hazardous substances that directly affect the functioning of the natural environment that is the main foundation of life and economic activity. Second, the natural environment has a limited assimilation capacity to absorb waste residue. Of course, if the amount exceeds this capacity, it will pose a serious threat to the stability and tolerance limits of the ecosystem. In some cases, the impact can be very dangerous. For example, water pollution with mercury can have a relatively small impact when pollution levels are low, according to Willt 196 | March 2013: 195-208 However, at a higher level, addressing the impacts can be crucial. In this case, mercury pollution can alter ecosystem function, thereby reducing the assimilation capacity of the natural environment (Perman et al, 2003). A closed organic waste storage facility is a container or system for storing organic waste in a closed manner. The goal is to control the decomposition process, reduce unpleasant odors, prevent pests, and maintain cleanliness. This system can be a closed composter, a compost container with a closed lid, or a closed vermicomposting system (home composting).

The primary method of handling household waste is incineration

The primary method of disposing of household waste is incineration. This method is recommended by many environmental and health organizations,

including the United Nations Environment Programme (UNEP). Incineration can produce hazardous pollutants such as dioxins and furans, which can harm human health and the environment. (UNEP Archives) (UNEP - United Nations Environment Programme) UNEP recommends a more holistic and sustainable approach to waste management, including waste reduction, reuse, and recycling. This method not only reduces waste generation but also saves resources and energy and creates economic opportunities through jobs in the recycling sector. (UNEP - United Nations Environment Programme) For effective waste management, UNEP recommends developing a national strategy that includes the safe collection, processing, and disposal of waste, as well as raising public awareness of the importance of sustainable waste management. (UNEP Document Archives) (UNEP - United Nations Environment Programme).

Preventing the transmission of disease through mosquito bites

A. Draining bathtubs/large buckets/drums

Draining empty bathtubs/large buckets/barrels. Empty bathtubs, large buckets, or barrels are effective in preventing mosquito-borne diseases. Research shows that this action helps reduce mosquito breeding sites, thereby reducing the risk of disease transmission. WHO (World Health Organization) According to research published by the World Health Organization (WHO), households often hoard water because water supplies are unpredictable and limited. Containers are not cleaned properly or frequently. Poor drainage and sanitation create more suitable breeding grounds for mosquitoes. WHO (2024) Water and sanitation measures to prevent and control mosquito-borne diseases: Focus on emergency situations

B. Destroying used items (cans, tires, etc.)

Destroying used products (cans, tires, etc.) Destroying used products (cans, tires, etc.) is an effective way to prevent mosquito-borne diseases. Research has shown that disposing of used items is a highly effective strategy for reducing Aedes mosquito populations. aegypti, which is the main vector of diseases such as dengue, Zika, and chikungunya. The number of larvae decreased within one month after this procedure was implemented. The reduction was up to 85%. Its effectiveness lies in reducing mosquito breeding sites, reducing mosquito numbers, and reducing disease cases. The long-term success of this intervention depends heavily on active community participation, ongoing education, and an environmentally friendly waste management approach. This program not only helps control vectors but also raises public awareness about the importance of maintaining a clean environment to improve health outcomes (Atikasari, Ekalina et al., 2018).

C. Use of mosquito coils/sprays/electric coils

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Use of mosquito coils/sprays/electric coils. Safe mosquito coils include citronella oil, DEET, and lemon eucalyptus oil (Krismi and Danarti, 2016). Mosquito repellents currently on the market contain the active ingredient N,N-diethyl-m-toluamide (DEET), a synthetic compound. Long-term use of DEET can cause various side effects such as hypersensitivity, irritation, and and itching, and the negative effects of DEET can even cause cancer. Therefore, mosquito repellent formulations are made from natural ingredients (Kardinan and Dhalimi, 2010). To reduce the effectiveness of synthetic mosquito repellents, additional methods must be used, such as using natural ingredients like plants. Many natural mosquito repellents are preferred because they are considered safer and a reliable way to avoid mosquito bites. Plant-based mosquito repellents have been used for thousands of years with simple methods such as burning plants to repel mosquitoes, and later developed into oils applied to the skin (Maia and Moore, 2011).

D. Ventilation with mosquito netting

Ventilation with Mosquito Screens Installing mosquito screens on the ventilation openings in your home is one effective way to prevent the transmission of diseases caused by mosquito bites. Mosquito screens function as a physical barrier to prevent mosquitoes from entering your home, reducing the risk of mosquito bites and the transmission of diseases such as dengue fever, malaria, and Zika (WHO, 2020) Installing cables on household ventilation systems is an effort to protect against mosquitoes, which indirectly also reduces the risk of exposure to liver fluke disease Installing cables on ventilation holes will reduce contact between mosquitoes and residents of the house, because mosquitoes carrying or vectoring worm diseases cannot enter (Juriastuti, 2010) Wire mesh has benefits for protecting against mosquitoes, flies, and other insects, including diseases such as malaria and liver fluke disease Wire mesh is a tool in the form of a thin, transparent curtain equipped with a net that can prevent the entry of insects and mosquitoes (Engka et al, 2017) The wire that is commonly used is shaped like a tent that covers the ventilation To be effective, there must be no holes or gaps that insects can get through (Engka et al, 2017) It has been statistically proven that wire mesh contributes to the emergence of liver fluke disease People who live in homes with non-mesh ventilation have a 3.6 times higher risk of developing liver fluke disease compared to homes with mesh ventilation (Ardias et al, (2012)

E. Sprinkling larvicide powder in water reservoirs

Applying larvicide powder to reservoirs Applying larvicide powder to reservoirs is an effective measure to prevent mosquito-borne diseases. The use of larvicide powder will significantly reduce the number of mosquito larvae in reservoirs. This study showed that the larval population was reduced by up to 90% two weeks after larvicide application. This impact is very

important because reducing the number of larvae also reduces the occurrence of adult larvae that can transmit disease. The significant reduction in larval numbers indicates that larvicide is very effective in breaking the mosquito life cycle at an early stage. However, this effect is temporary and requires repeated applications to maintain permanent control. The success of this program depends heavily on community education, active participation, and regular monitoring. An integrated and sustainable approach makes larvicide use a key part of mosquito control and mosquito-borne disease prevention strategies, thus providing significant health benefits to local communities. Studies on the use of insecticide powder in reservoirs have shown excellent results in controlling the population of Aedes aegypti, which is the main vector of diseases such as dengue fever (DHF), chikungunya, and Zika. Research conducted by Nurhayati and Santoso (2020) published in the Journal of Health Ecology provides empirical evidence of the effectiveness of this method in the context of vector control in the community.

F. Covering Household Water Reservoirs

Covering water storage containers in your home. Covering all water storage containers inside and outside the home. If SPEKTA is not required, please install water storage containers outside the home to prevent rainwater from entering. Female mosquitoes utilize stagnant water as a breeding ground. Prevention and eradication of extraordinary dengue fever outbreaks (KLB) cannot be achieved without community cooperation and participation in dengue prevention and control campaigns. The community is encouraged to take the following PSN prevention measures: For example, draining water reservoirs, disposing of solid waste, preventing vector breeding, and preventing mosquito bites (Clano et al, 2006).

Households that empty water reservoirs

Households that empty their water reservoirs (tubs, large buckets, barrels) at least once a week have fewer mosquito larvae than households that empty their water reservoirs less frequently and have low water densities. This study concluded that emptying reservoirs at least once a week is an effective way to control the density of Aedes aegypti larvae and prevent mosquito-borne diseases. A higher frequency, for example, every 2-3 days, provides more optimal results in controlling mosquito larva populations (Wahyuni, S & Hartono, T 2018).

Interior Conditions

Interior Conditions To ensure a healthy indoor environment, the size and placement of windows to ensure natural light and good ventilation are very important. Below you will find information and guidelines based on scientific research and recommendations from environmental and health experts (Simbolon, Hendra et al., 2017).

A. Windows

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Rooms with large windows that receive direct sunlight also have lower humidity, reducing the risk of mold and bacterial growth (Simbolon, (Hendra et al., 2017)

B. Ventilation

Research shows that homes with good ventilation and natural lighting have better indoor air quality, which contributes to better respiratory health (Simbolon, Hendra et al., 2017).

C. Light

Adequate natural light can reduce reliance on artificial lighting, which not only saves energy but also benefits mental and physical health (Simbolon, Hendra et al., 2017).

The primary water supply system used by households for drinking purposes is refilled water.

The primary water supply system used by households for drinking purposes is refilled water. In terms of price, refilled drinking water (AMIU) is currently the preferred choice for consumers. This drinking water can be purchased at depots for a third less than branded bottled water.

The public's tendency to consume refilled drinking water is very high and the need for it is also increasing. However, it remains to be seen whether the quality of refilled drinking water can be determined. Therefore, it is necessary to monitor and control the operation of refilled drinking water storage facilities (Mirza, 2014). Drinking Water Depots (DAM) are companies that process drinking water in bulk form and sell it directly to consumers in the form of filled containers/gallons of drinking water. Drinking water may not be stored in DAMs for more than 1 x 24 hours (Minister of Health Regulation No. 43 of 2014). Refilling drinking water storage facilities require drinking water test reports prepared by a water quality control laboratory appointed or certified by the district/city government. Drinking water produced by DAMIU must meet the drinking water quality requirements stipulated in Minister of Health Regulation No. 492 of 2010 (Minister of Industry and Trade Decree, 2004) refilled drinking water (Mirza, 2014).

The primary water source used for household purposes is a drilled well/pump.

A drilled well is the primary water supply system for household purposes using a well/pump. It is used to produce clean water using groundwater. Drilled wells have advantages over conventional wells, such as greater depth and better water quality, making them the most efficient option for optimal groundwater utilization (Manurung et al., 2017).

In general, groundwater does not have the same potential for damage as surface water. However, groundwater damage can occur if the groundwater or environmental conditions are disturbed, for example, by groundwater extraction

exceeding the groundwater's carrying capacity, pollution, or natural activities (Dwangga et al., 2020). The primary water needs of the community drive stronger economic and social values (Afdaliah & Pristianto, 2019).

Various water conservation initiatives can be implemented to efficiently use water resources to provide socio-economic benefits and support sustainable livelihoods (Budhie et al., 2013). On the other hand, given the importance of water as a basic human need, some community groups Lack of access to clean water. Equal and equitable access to clean water services for all communities must be guaranteed by the government (Izzah, 2018).

On the other hand, given the importance of water as a basic human need, some communities lack access to clean water. Equal and equitable access to clean water services for all communities must include: Guaranteed by the government (Izzah, 2018).

Water usage.

A household member requires approximately 120-150 liters of water daily for cooking, bathing, washing clothes, and eating utensils. Households with more than one person may require more water. Reducing the overall amount of water used can be achieved by implementing water-saving measures and using efficient appliances (Hermawan, H., Fiantoro, D. et al., 2023).

4. CONCLUSION

Research on Jln. Amaliun, North Sumatra, Medan Area District, found that environmental health in the area is quite good, as 70% of residents dispose of their trash properly and avoid polluting the environment. Sanitation is also quite good, with only 10% disposing of waste directly on the ground or using a container. Similarly, awareness of mosquito vector transmission is high, with many adopting mosquito repellent and maintaining home hygiene, which is related to mosquito transmission. Unfortunately, only a few use larvicide powder to prevent mosquito larvae from breeding in stagnant water. Furthermore, more than 70% of homes have adequate lighting in bedrooms, kitchens, and living rooms. Water usage is also normal, ranging from 200 to 350 liters per day. So, according to our research and monitoring that went directly to the area, we think that the environmental health there is good and well maintained, as well as the friendly and kind people, we were welcomed warmly by the local residents, but our suggestion is that there should be no more people throwing rubbish anywhere that can cause damage to the surrounding environment and the natural environment in the area.

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