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Analysis of the Physical Quality of Clean Water in Ward I Belawan I Medan Village

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ABSTRACT

The degree of public health is strongly influenced by healthy environmental conditions including the ownership of clean water. The use of water in daily life in neighborhood I of Belawan I Medan Village is almost average using borehole water. The problem raised in this study is the feasibility of using borehole water as clean water for daily needs in Belawan I Village related to the availability of clean water that is not good. The purpose of this study was to determine the physical quality of water in the Coastal Area of Neighborhood I, Belawan I Village. This research method uses descriptive research with a qualitative approach. Total respondents were 44 people with a population of 80 families. The data collection methods used in this study were observation, interview and documentation. Based on the results of observations, it was found that the community in Belawan 1 Village does not yet have access to clean water facilities due to obstacles, and not all people use PDAM water, some also use boreholes for their daily needs. People in Belawan I urban village do not have access to clean water facilities, not all houses use PDAM water due to constraints, some also use boreholes for daily needs. From the results of the research conducted, local governments and related agencies can immediately take steps to improve access to clean water in Belawan I Kelurahan. And not only access to water, but also community education on clean water.

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INTRODUCTION

In human life, water is a very important substance with the chemical formula H2O, where each water molecule consists of two hydrogen atoms bonded to one oxygen atom through a covalent bond. In general, water under standard conditions does not have a distinctive color, taste, or smell. However, water that is fit for consumption must meet certain quality standards. Consuming unclean water for a short period of time can cause symptoms of diseases such as diarrhea, vomiting, typhoid, cholera, or dysentery. The basis for the management and control of water pollution is guided by government regulation No. 82 of 2001 concerning clean water quality management and water pollution control. (Maria Ulfa et al., 2021). The provision of safe and affordable clean water is one of the very, very strategic problems faced by the government. The provision of safe and affordable clean water will not only make the achievement of Sustainable Development Goal (SDG) 6 but will also be a center for achieving other SDGs, for example poverty alleviation and others. (Novriadhy, 2020).

The problem of clean water availability does not only occur in small areas, but this often occurs as a global problem. The availability of water in an area is mainly influenced by three components, namely the existence of adequate water resources, the existence of adequate policies and institutions to manage water resources, and the existence of infrastructure for water supply (As, 2019). Water is one of the most important elements for the life of living things on earth. Water is a vital necessity for life and a basic source for the survival of life on earth. The existence of water is absolutely necessary because life on earth cannot proceed without water (Walid, Ahmad, et al., 2020).

Based on the Decree of the Minister of Health of the Republic of Indonesia No. 907 of 2002, it is said that drinking water is water that has gone through a treatment process or without a treatment process that meets health requirements (bacteriological, chemical, radioactive, and physical) and can be directly drunk (Ministry of Tourism, 2004). As for these requirements, clean water must meet several conditions which include physical, chemical, bacteriological, and radiological aspects. Physically, the water should be clear, odorless, and free of unwanted tastes. In addition, the temperature of clean water should not differ much from the temperature of the surrounding air, with a maximum limit of difference of about ±3°C. In terms of chemistry, clean water must not contain chemical substances in quantities that exceed the set limits. Bacteriologically and microbiologically, clean water must be free of pathogenic and parasitic germs that can harm human health. Finally, from a radiological point of view, clean water should not contain substances that can produce radioactive materials such as alpha, beta, and gamma rays, which can harm humans and the environment. By meeting all these conditions, clean water can be guaranteed to be safe for use in various human purposes.

Water quality is the quality characteristic needed for the specific utilization of water sources. With water quality standards, people can measure the quality of various types of water. Each type of water can be measured by the concentration of element content listed in the quality standard, thus the quality requirements can be known, in other words the quality standard jord can be used as a benchmark for water feasibility for human use (Effendi, 2019).

The community's need for clean water emphasizes that water monitoring must be carried out carefully and regularly and the need to take measures to monitor and prevent pollution of clean water sources in the community (Hayati, R., Irianty, H., & Mahmudah, M. (2021). The high level of human activity in the Ward I area, Belawan I Village is feared to have an impact on pollution conditions on water quality conditions, therefore special attention is needed for water quality control and management for current and future needs. The use of spring water sources can no longer be used optimally, this is due to pollution and changes in the ecosystem in natural water sources and poor local water conditions so that water quality decreases and cannot be used for household needs, especially it is difficult to get clean water that meets health requirements. (Muetia, et al., 2023).

Neighborhood I Area, Belawan I Village is part of Medan which has unique characteristics along the coast. Located on the seafront, the region is a hub of economic and social activity for the locals. The majority of the residents rely on drilled wells as the main source of clean water on a daily basis, although not all homes have access to clean water services from PDAMs. However, the challenge of clean water availability remains a major focus, with some homes relying on drilled wells as the main alternative. People who live in Ward I, Belawan I Village is a coastal area whose water conditions are very far away are said to meet the requirements, a group of people in the coastal area of Ward I have a livelihood as fishermen, construction workers, and pedicab drivers. The lack of income of the community leads to poverty of families and infrastructure, this situation affects the use of water by the community such as daily activities and drinking water. Therefore, the community of Ward I still uses seawater for their daily needs. The availability of clean water in Ward I, Belawan I Village is not good because there is a problem that there is no clean water channel and it is more dominant to use dug well water sources.

The purpose of this study is to evaluate the physical quality of water in the Coastal Area of Environment I, Belawan I Village, Medan, especially in the context of using drilled well water as the main source for daily needs. The study aims to assess the safety and feasibility of using borewell water as clean water, considering the obstacles in the availability of clean water that are still faced by the local community. Based on the results of observations, that people in Belawan 1 Village do not have access to clean water facilities but not all houses do not use them due to constraints, and not all people use PDAM water, some also use drilled wells for daily needs. The importance of environmental sanitation efforts, many people still do not see the importance of clean water facilities as a necessity for health. Regarding the availability of clean water in the Ward 1 Village Area, Belawan 1 Village is not good because there are problems that do not meet health requirements, namely odorless, colorful, tasteless, and free from sediment at the bottom of the container in residents' houses. This study aims to help provide an overview of environmental sanitation conditions for clean water facilities in the Coastal Area in Ward 1, Belawan 1 Village.

METHODOLOGY

This study uses descriptive research with a qualitative approach. Where the data collection method carried out in this study is through observation, interviews and documentation. The population in this study is 24,489 people and a sample representing 44 respondents. The location of the research is in Ward I, Belawan I Village.

RESULTS

Table 1. Characteristics of Respondents

	Frequency (f)	Percentage (%)
Age		
<20 Years	19	45.2
20-30 Years	21	47.6
>30 Years	4	7.1
Gender		
Man	18	38.1
Woman	26	61.9
Last Education		
SD	9	19.0
JUNIOR	14	33.3
SMA	15	33.3
Bachelor	6	14.3
Total	**44**	**100**

Based on the distribution table of respondent characteristics in the study, it shows that out of a total of 44 respondents, as many as 18 are male (38.1%) and as many as 26 are female (61.9%), the age category that has the most age is 20-30 years old (47.6), < 20 years (45.2), >30 years (7.1). Based on the level of education, the respondents who have the most education are at the junior high and high school levels, the percentage is (33.3%), the respondents who have the least last education are at the elementary level (19.0), the percentage at the S1 level is (14.3%).

Table 2. Physical Quality of Clean Water

Variable	Frequency (n)	Percentage
Smell		
Smell	35	81,0
Odorless	9	19,0
Taste		
Felt	35	78,6
Feeling	9	21,4
Color		
Colored	37	85,7
Colorless	7	14,3
Source		
PAM	6	9,5
Drilled Wells	38	90,5
Total	**44**	**100**

Based on table 2, the results of clean water supply show that there are 35 respondents (81.0%) who have smelly water and 9 respondents who do not have odorless water (19.0), there are 35 respondents (78.6%) whose water has taste, while as many as 9 respondents (21.4%) have no taste. Regarding colored

water, there were 37 respondents (85.7%), and colorless water had 7 respondents (14.3).

DISCUSSION

The role of water is very big in human life, water is used for various aspects of daily needs such as drinking, bathing and many more. But if the water does not meet the requirements for clean water, it can become a medium for disease transmission. According to data from the Ministry of Health, drinking water that is suitable for consumption must meet health requirements, be odorless, clear in color, taste tasteless, not exposed to direct sunlight, and free from sediment at the bottom of the container. Table 2 shows that of the 44 respondents in this study, as many as 35 respondents (81.0%) had an odor in their water, while 9 respondents (19.0%) had no smell in their water.

There were 35 respondents (78.6%) whose water had taste, while as many as 9 respondents (21.4%) had no taste in water. Regarding color, there were 37 respondents (85.7%) who had water that was not clear in color, while 7 respondents (14.3%) had water that was clear in color. The people of Belawan 1 still use drilled wells for their daily lives, but not all of them use drilled wells because there are several people who use PDAM water. According to the respondent data we obtained, there are around 6 respondents (9.5%) who use PDAM water, while the other 38 respondents (90.5%) use drilled wells as a source of water that will be used daily. The physical quality of water can be seen directly with the senses, the physical properties consist of:

Smell

Foul-smelling water contains organic matter that is undergoing decomposition by microorganisms. Based on previous research, the cause of smelly water can be caused by the proximity of animal farms to well water or also due to the proximity of garbage dumps and well water (Lantapon et al., 2019).

Based on the results of observation, it was obtained that as many as 35 respondents (81%) of residents' water smelled, because as many as 38 respondents (90.5%) of residents in Ward I of Belawan I Village got the source of clean water from the drilled well, the results of interviews with the surrounding community got the water source from the drilled well with the physical condition of the water smelling because around the water source (well) there were a lot of piles of garbage.

Taste

Water that has a taste is definitely unhealthy, because water that tastes (salty) is caused by the presence of certain salts that are soluble in water. The high salt content consumed causes excess calcium in the kidneys, allowing kidney stones to form. According to the Washington Taste Department of Health (2019), clean water that does not meet the requirements of taste parameters has several causes, including metallic taste caused by metallic materials (iron, copper and manganese) dissolving into water through pipes. Chlorine taste, chemicals and drugs may have added chlorine in the processing for the disinfectant process. Salt taste Usually high levels of sodium, magnesium, and potassium in water will naturally cause salty taste. This risk occurs if this water source is located near the coast.

Based on the results of observations, it was obtained that 35 respondents (81%) of the residents' water tasted salty, especially residents whose water source was from a well (90.5%) because the well was close to the sea and as many as 9 respondents (19%) of the residents' water did not taste (salty) because 6 of them got a water source from the PDAM and the other 3 used water filtration equipment.

Color

Colored water means that it contains other ingredients that are harmful to health such as containing iron, when the iron content is high, the water can change color to yellow, orange or brown.

Based on previous research, water that contains high iron can be dangerous. Iron (Fe) is a substance that is very dangerous for the human body and of course should not enter the body. High iron levels in water not only interfere with various daily tasks but can also interfere with the health of the wearer's body (Kurniawati et al., 2021).

Based on the observation results, as many as 38 (90.5) residents use wells and as many as 6 (9.5%) use PDAM, judging from the percentage, it can be seen that more residents use wells than those who use PDAM water as a source of clean water and it is known that as many as 37 respondents (85.7) of colored residents' water get water sources from wells, the factor that causes cloudy water is the digging of wells that are not deep due to limited funds for the surrounding community to dig wells Therefore, they are only able to dig a well that is not deep, then another factor is the condition of the place where the well is dug, namely the poor soil condition.

Health impact

The use of unclean borewell water can have a serious impact on public health in Ward I, Belawan I Village, Medan. Based on the results of the study, it was identified that most of the water used by the

population has characteristics that do not meet health standards. In particular, the water often has a foul odor due to the decomposition of organic matter from waste adjacent to the location of the drilled well. In addition, a lot of water also has a salty taste, which can be caused by the high salt content due to the location of the wells adjacent to the beach. In addition, some water is also yellow, orange, or brown because it contains high levels of iron, which can harm the health of the human body. This condition shows that the use of unclean borewell water can cause risks to public health, including digestive problems such as diarrhea, vomiting, and other health problems caused by microbial contamination and harmful substances in the water.

CONCLUSION

Based on the results of the research, the data obtained amounted to 35 respondents (81.0%) whose water had an odor, while 9 respondents (19.0%) had no odor in their water, Based on the results of the data obtained there were 35 respondents (78.6%) whose water had a taste, while as many as 9 respondents (21.4%) had no taste in their water. The presence of taste in water does not meet health requirements. Regarding color, there were 37 respondents (85.7%) who had water that was not clear in color, while 7 respondents (14.3%) had water that was clear in color. There were 6 respondents (9.5%) who used PDAM water, while the other 38 respondents (90.5%) used drilled wells as a source of water that would be used daily. The use of unclean borewell water in Ward I, Belawan I Village, Medan, can cause serious impacts on public health, including bad odors from the decomposition of organic matter, saltiness due to high salt content, and turbid water color due to high iron content. This indicates a risk to health, such as digestive problems and other disorders, caused by microbial contamination and harmful substances in the water. The people of Belawan Village do not have access to clean water, but there are already houses that have PDAM water.

SUGGESTION

With this research, it is hoped that the public will pay more attention to the importance of physical water quality to improve public health.

REFERENCES

Annisa, C., & Susilawati, S. (2022). Overview of Environmental Sanitation of Clean Water Facilities and Family Toilets in Sukaraja Village. PubHealth Journal of Public Health, 1(1), 85-90.

Arma, I. G., Reka, P., Putu, N., Astuti, W., Ngurah, N., & Sanjaya, A. (2019). Analysis of the Relationship between Physical Conditions and Water Quality in the Plus Dig Well in the Working Area of Puskesmas II South Denpasar. Higiene, 6(2), 52–63.

Basri, L. (2019). Portrait of Excavated Well Clean Water Facilities in the Working Area of the Nania Health Center, Ambon City. Global Health Science, 4(2), 54-58.

Dahuri, R. (2013). Integrated management of coastal and ocean resources.

Djula, S. N. (2019). Study on the Availability of Clean Water and Household Drinking Water Supply in Oebobo Village, Oebobo District in 2019 (Doctoral dissertation, Polytechnic of the Ministry of Health, Kupang).

Effendi, H. (2019). Water quality study for the management of aquatic resources and environment.

Fernandez, Y. H., Toruan, L. N. L., & Soewarlan, L. C. (2023). The level of marine water pollution on the coast of Kupang Bay, East Nusa Tenggara, Indonesia. PoluSea: Water and Marine Pollution Journal March, 1(1), 24–44.

Hayati, R., Irianty, H., & Mahmudah, M. (2021). Overview of Family Toilet Conditions, Clean Water Facilities and Water Consumption Patterns in the Community of Surgi Mufti Village. An- Nadaa: Journal of Public Health (e-Journal), 8(1), 73-78.

Health, M. (2002, November 13). Regulation of the Minister of Health No.416 of 1990 concerning the requirements and supervision of Water Quality.

Kurniawati, R. D., Kraar, M. H., Amalia, V. N., & Kusaeri, M. T. (2020). Increasing access to clean water through socialization and simple water filtration in Haurpugur village. Journal of Community Service and Quality Improvement (JANAYU), 1(2).

Lantapon, H., Pinontoan, O. R., & Akili, R. H. (2019). Analysis of well water quality based on physical parameters and acidity (ph) in Moyongkota Village, East Bolaang Mongondow Regency. Kesmas, 8(7).

Maria Ulfa, A., Hilmi, A., & Rabiatul Adawiah, S. (2021). Analysis of Groundwater Quality in the Coastal Area of Labuhan Kertasari Village, West Sumbawa. Analytical:Analytical and

Environmental Chemistry, 6(01), 22–32

Nanda, M., Fatimah, S., Syazanani, T. S., Febriani, D., Atfrikahani, Y., Syahputra, S., & Fauziah, Q. (2023). THE RELATIONSHIP BETWEEN THE PHYSICAL CONDITION OF CLEAN WATER AND ITS CONSTRAINTS IN THE CENTRAL FISHING VILLAGE AND UJUNG KARANG, BELAWAN I VILLAGE. Tambusai Health Journal, 4(3), 2922-2926.

Novriadhy, D. (2020). Clean water quality and its potential impact on public health in Muara Enim Regency. Journal of Health Ecology, 19(1), 35– 44.

Setioningrum, R. N. K., Sulistyorini, L., & Rahayu, W. I. (2020). Overview of Clean Water Quality in Domestic Areas in East Java in 2019. Journal of Public Health Sciences, 16(2), 87-94.

Yoga, I. G. A. P. R., Astuti, N. P. W., & Sanjaya, N. N. A. (2020). Analysis of the relationship between physical condition and water quality in dug plus wells in the working area of Puskesmas II South Denpasar. HIGIENE: Journal of Environmental Health, 6(2), 52-63.

Walid, A., Kusumah, R. G. T., Putra, E. P., Herlina, W., & Suciarti, P. (2020). The Influence of the Existence of Landfills on the Quality of Clean Water in Residential Areas of Surrounding Residents: A Literature Study. Scientific Journal of Batanghari University of Jambi, 20(3), 1075-1078.