ASJo: Aceh Sanitation Journal **e-ISSN:2962-567X=P-ISSN:2963-895X**
Volume 2 Number 2, Month Desember
https://journal.poltekkesaceh.ac.id/index.php/asjo

Analysis Of Clean Water Use And Percentage Of Diarrhea Disease In Communities In Indra Jaya District, Aceh Jaya District, 2023

Mhd.Hidayattullah
Public Health Study Program, Faculty of Health Sciences, Abulyatama University
mhd.hidayattullah_kesmas@abulyatama.ac.id

Natasya Ulfa
Public Health Study Program, Faculty of Health Sciences, Abulyatama Abulyatama
natasyaulfa796@gmail.com

Submitted: 13/12/2023 *Accepted: 20/12/2023* *Published: 15/12/2023*

ABSTRACT

This research aims to analyze the relationship between clean water usage and the percentage of diarrhea incidence in the community of Indra Jaya, Aceh Jaya Sub-district, Surabaya. The study focuses on the primary water sources used by residents, environmental sanitation conditions, and household water treatment practices. The research employed data collection through questionnaires and observations, alongside statistical analysis to assess the relationship between water sources and the incidence of diarrhea. The results indicate that the majority of respondents use river and well water as their main water sources, with a 53.3% incidence of diarrhea. Statistical analysis reveals a significant correlation between poor water sources and a high percentage of diarrhea incidence. Environmental sanitation conditions, particularly the practice of personal hygiene (Mandi, Cuci, Kakus), also influence the risk of diarrhea, especially for those using river water. The importance of household water treatment, such as boiling, as an effective measure to prevent diarrhea, is highlighted in this research. Additionally, the study underscores the role of increasing community awareness regarding the cleanliness of water sources and environmental sanitation in reducing the risk of diarrhea. To decrease the incidence of diarrhea, preventive measures involving the government and healthcare professionals are recommended, including improving community access to safe water and conducting routine sanitation inspections to ensure the safety of water sources.

Keywords: *Clean Water, Diarrhea, and Society*

INTRODUCTION

In the household environment, all cleanliness and health behaviors are carried out individual awareness so that each member of the family or family can help themselves in the field of health and play an active role in health activities in the community. PHBS targets in households The sequence is all family members, namely: children and teenagers, couples of childbearing age, pregnant and/or breastfeeding mothers, the elderly, and caregivers [(1)].

The role of water is very important to maintain the continuity of life, so humans try to get enough water for themselves. However, in many cases the water used does not always comply with health requirements. It is often found that this water contains germs or certain substances that can cause diseases that actually endanger human survival. According to Minister of Health Regulation No. 492/Menkes/PerIV/2010 concerning Health Requirements for Drinking Water, the permissible concentration in 100 ml of water sample is 0 with the

physical requirements being odorless, tasteless and the color not more than 15 mg/l [(2)].

Based on the results of the 2019 Riskesdas, households whose water use was less than 20 liters/person/day was 14%, a decrease compared to 2018. Households with 'good' physical drinking water quality increased from 86% in 2018 to 90 % in 2019. Not all main sources of water for household use are used as drinking water sources. For example, 19.7% of tap water/PAM is used as the main source of water for household purposes, but only 14.4% is used as drinking water, or around 27.0% of tap water/PAM is not used as a water source. Drink [(3)].

There is a shift in the pattern of use of drinking water sources, especially in urban areas, where the use of bottled water as drinking water increased from 6% in 2010 to 7.2% in 2018. Meanwhile, more households used drinking water depots as a source of drinking water. high (13.8%). Household access to protected drinking water sources according to the MDGs criteria is 45.1%. There is a decline in household access to protected drinking water sources, especially in urban areas, so that the achievement of the MDGs is in the 'on' position the wrong track'. If you take into account bottled water and water from drinking water depots, the percentage of households with access to protected drinking water sources is 66.7%. Access to 'quality' drinking water sources that consider the type of protected water source (including bottled water and drinking water depots), distance to drinking water sources, ease of obtaining drinking water and physical quality of drinking water is 67.5% with the highest percentage in the Province DKI Jakarta (87.0%) and the lowest in West Kalimantan Province (35.9%) [(4)].

Data from the Ministry of Health of the Republic of Indonesia states that Aceh Province is one of the regions that is below national health standards, such as population problems with access to adequate basic sanitation 38.43% (national coverage 51.19%), healthy homes 53.35% (national coverage 63.49%), babies exclusively breastfed 55.1 (national coverage 61.39%) [(5)].

Diarrhea is a disease of the digestive tract in which sufferers experience the condition of having to defecate continuously with a frequency of three or more times a day and the feces excreted contain excessive fluid, so that diarrhea patients will experience loss of body fluids which can cause dehydration and can cause death. Clinically, diarrhea can be caused by infection (bacterial, viral and parasitic infections), malabsorption, allergies, food poisoning [(6)].

Several studies state that the main factor influencing the occurrence of diarrhea is the health of the surrounding environment, including the use of clean water facilities, waste and waste management, clean living behavior and the most dominant factor is the source of drinking water consumed. Based on WHO data, diarrhea is the second leading cause of death in children under the age of five in the world with a death rate of around 525,000 children in 2020 [(7)].

Based on the results of the 2019 Riskesdas, it is known that the prevalence of diarrhea based on the diagnosis of health workers in Indonesia is 6.8%. This is of course an increase compared to the 2019 Riskesdas results, which were only 4.5%. Meanwhile, the prevalence of diarrhea based on the diagnosis of health workers for Gorontalo Province was 8.83% with the prevalence of diarrhea in children under five being 12.60%. Water is a source of disease due to disease vectors, especially diarrheal disease, which is transmitted through water that is not of good quality [(8)].

Research conducted by Sumolang D. (2019) states that there is a relationship between the quality of drinking water sources and the incidence of diarrhea. In 2019, Feby Victiani and Salamah said that good sanitation and drinking water sources influence the incidence of diarrhea, research conducted. Regarding the type of drinking water source to the incidence of diarrhea using the Chi- Square Test, results were obtained with a p value <0.005, which means there is a relationship between the incidence of diarrhea and the source of drinking water consumed. In addition, the source of drinking water is an important factor related to the incidence of diarrhea. This is because most of the infectious germs that cause diarrhea come from water [(9)].

Water is one of the natural resources needed by all living creatures, the availability of water can balance development in all sectors of life (Zarkasih, 2019). The water source itself is obtained from ground water and surface water. For groundwater itself, since 1970-2020, groundwater levels have decreased by 80 percent. Meanwhile, clean surface water can be obtained from rivers, seas and lakes [(10)].

From the description above, the author is interested in discussing "Analysis of Clean Water Use and the Percentage of Diarrhea Diseases in the Community in Indra Jaya District, Aceh Jaya Regency in 2023".

METHOD

This type of research is observational analytical research, with a cross sectional approach. The independent variable is the water source and the dependent variable is the incidence of diarrhea. This research was located in Indra Jaya District, Aceh Jaya Regency in 2023. The population was the entire community of Indra Jaya District Village, totaling 300 people. With a sample size of 75 people taken using a simple random sampling technique. Data was collected using a questionnaire and then processed and analyzed using the Spearman Rank correlation test with a significance level of 0.1. Ho is rejected if the probability value is smaller than the significance level ($\rho < \alpha$). This research is located in Indra Jaya District, Aceh Jaya Regency in 2023.

The data sources for this research come from two data sources, namely primary data and secondary data. Primary data is data obtained by researchers from original sources. This primary data is the main data that will be processed and examined in collecting data in this research. This primary data source was obtained from accurate data originating from Indra Jaya District as a place for research and research implementation.

Secondary data is data obtained indirectly or data that was previously available, so researchers use this data as supporting material for research. This secondary data source is obtained through media intermediaries (obtained and recorded by other parties), documents, files, book literature, and archives or direct news. This data is used to complete primary data.

RESULTS AND DISCUSSION

a. Research result

Univariate Analysis

Table 1 Frequency Distribution of Diarrhea Incidents in Indra Jaya District Communities Aceh Jaya Regency

Diarrhea Occurrence	Frequency	Percentage (%)
DiarrheaNo	40	53,3
	35	46,7
Amount	75	100,0

Based on table 1, the results obtained from 75 respondents, 40 people (53.3%) experienced diarrhea and 35 people (46.7%) did not experience diarrhea. There are more people who experience diarrhea compared to people who do not experience diarrhea. The condition of the water source in this research is the physical condition of clean water facilities in the homes where people live. Meanwhile, the source of water facilities is the water source used by respondents for MCK (bathing, washing, toileting) and cooking purposes.

Table 2 Distribution of Water Sources Used by the Community of Indra Jaya District Aceh Jaya Regency

Water sources	Frequency	Percentage (%)
River	39	52
Well	36	48
PDAM	0	0
Amount	75	100,0

From table 2, it is known that 39 respondents (52%) only used clean water from rivers and 36 respondents (48%) from wells.

Table 3 Distribution of Conditions of Water Source Facilities Used by the Community Indra Jaya District, Aceh Jaya Regency.

Condition of Facilities Water sources	Frequency	Percentage (%)
Baik	30	40
Buruk	45	60
Amount	75	100,0

Based on the results in table 3, the condition of clean water source facilities is categorized into good and bad. It is known that the majority of respondents have poor water

source conditions, namely 45 respondents (60%). Meanwhile, 30 respondents (40%) had good water source conditions.

Bivariate Analysis

Table 4 Cross Tabulation of the Relationship between water sources (Rivers and Wells) and Diarrhea Incidence in the Community of Indra Jaya District, Aceh Jaya Regency.

Water sources	Diarrhea Occurrenc				Total	**OR**	**CI-95%**	**P-Value**
	Diarrhea		No Diarrhea					
	n	%	n	%	%			
River water	23	58,9	16	41,1	39 100	**2,303**	**2,852 - 3,471**	
Well water	17	47,2	19	52,8	36 100			**0,001**
Amount	40	53,3	35	46,7	75 100			

The results of the analysis of the relationship between water sources and the incidence of diarrhea showed that there were 23 people (58.9%) who used river water and experienced diarrhea. Meanwhile, 17 people (47.2%) who used well water experienced diarrhea. From these statistical results, it shows a significant relationship between the use of water sources and the incidence of diarrhea with a p-value of 0.001, so it can be concluded that there is a relationship between water sources and the incidence of diarrhea in the community of Indra Jaya District, Aceh Jaya Regency. From the results of the analysis, it was also obtained that the value OR=2.303 means that people in Indra Jaya District, Aceh Jaya Regency who use river water are 2.303 more likely to experience diarrhea.

b. Discussio

Discussion on Analysis of Clean Water Use and the Percentage of Diarrhea Diseases in the Community in Indra Jaya District

According to Government Regulation Number 82 of 2001 concerning Water Quality Management and Water Pollution Control, what is called a water source is a water container located above and below the surface of the land, including the meaning of aquifers, springs, rivers, lakes, lakes, reservoirs and estuaries. In this research, the emphasis is on water sourced from rivers, wells and PDAMs used by local communities [(11)].

The research results in table 2 show that the majority of respondents used river water as a water source, namely 39 respondents (52%) and other respondents used river water as a water source, namely 36 respondents (48%). In the village There are no people in Indra Jaya District who use PDAM water sourcesbecause the village area does not receive water flow from PDAM, plus the location of the Indra Jaya Subdistrict Village which is directly adjacent to the community prefers to use river water or well water. In the cross tabulation results, it was found that 58.9% of respondents used river water and got diarrhea, while 47.2% of respondents used well water and got diarrhea.

The availability of clean water sources is one of the efforts to improve the level of public health. Environmental health is carried out to create a healthy environment, namely a condition that is free from risks that endanger the health and safety of human life. Environmental health includes water sanitation, namely securing and determining water quality for various needs and human life. Thus, water used for daily needs, apart from fulfilling or covering the quantity, must also meet the specified quality. The importance of good quality water needs to be provided to meet basic needs in preventing the spread of infectious diseases through water [(12)].

Diarrhea is defined as a disease characterized by changes in the shape and concentration of feces and an increase in the frequency of defecation more than usual (more than 3 times), diarrhea is defecation with abnormal frequency (increased) and a stool consistency that is softer or more liquid [(13)].

The incidence of diarrhea in this study was measured using a questionnaire containing questions related to the definition of diarrheal disease. From the research results in table 1, it is known that the majority of people in Indra Jaya District Village have experienced or often experience diarrhea, namely 53.3% or 40 respondents.

Based on the results of the questionnaire scoring conducted by researchers, which are described in table 3, it shows that the majority of respondents had poor water sources, namely 45 respondents (60%) and 30 respondents with good water sources (40%).

From the results of the relationship analysis, it is known that respondents who experienced more diarrhea were those with a poor percentage of water source conditions, namely 28 respondents (58.3%). Meanwhile, only 12 respondents (44.4%) had good water source conditions and suffered from diarrhea. It can be concluded that there is no significant level or gap between the percentage of people suffering from diarrhea in good or bad water source conditions.

Meanwhile, from the results of statistical testing using the Spearman Rank test, the calculated rho value = 0.463, with a significance level of 10%. Or in other words, the p value = 0.087 is smaller than 0.1, so Ho is rejected, H1 is accepted. This means there is The relationship between water sources and the incidence of diarrhea in the community of Indra Jaya District, Aceh Jaya Regency.

Water can play a role in transmitting disease through microorganisms that are transmitted via water (water-borne disease) or equipment that is washed with water (water-washed disease). Most diarrhea is caused by bacterial infections that are transmitted via the fecal-oral route. Diarrhea can be transmitted through fluids or materials contaminated by feces such as drinking water, hands or fingers, food prepared in a pan that has been washed with contaminated water [(14)].

When conducting interviews, the researcher also made observations and obtained the following data: For MCK activities (bathing, washing, toileting), the local community mostly uses water sourced from rivers and wells. People who use river water as a water source for their daily needs can increase the risk of diarrhea due to direct contact with organisms in the water (water contact disease) [(15)].

Some people who use wells and have a latrine (family latrine) at home do not meet environmental health requirements, because to avoid microbiological pollution, the safe distance between the well wall and the source of pollution is 10 meters, whereas on average, the latrine is located directly next to the well. So it can pollute well water which is used as a water source.

According to the Indonesian Ministry of Health 2022, processing household drinking

water, one of which is boiling, is efficient in killing microorganisms so that it does not cause diarrhea. Water that is not managed according to household drinking water management standards can cause disease. Treatment of household drinking water can improve the microbiological quality of household drinking water with simple and affordable methods and reduce the incidence and death rates caused by water- borne diseases such as diarrhea. Meanwhile, refill water has basically been processed through filtration and disinfection. The filtration process is intended not only to separate suspended matter, but also to separate mixtures in colloidal form including microorganisms from the water, while disinfection is intended to kill microorganisms that were not filtered out by the previous process. So that the pathogenic bacteria in drinking water die before consumption [(2)].

According to Samiyati, M., Suhartono, & Dharminto. (2019). Improving water sources (quality and quantity) and individual success will reduce the possibility of being infected by pathogenic bacteria. People who are provided with clean water have a lower risk of suffering from diarrhea than people who do not get clean water. People can reduce the risk of diarrhea attacks by using clean water and water that is protected from contamination from source to storage. Therefore, it is necessary to increase the supervision of health workers to carry out sanitation inspections of clean water facilities and educate the public to pay attention to the water sources used. Clean water is used to protect it from contamination, namely maintaining the cleanliness of the well by repairing the construction and keeping the well building, distribution pipes and storage areas clean [(16)].

CONCLUSION

From the results of the explanation above, it can be concluded that, the majority of people in Indra Jaya District, Aceh Jaya Regency, use river water and wells as the main water source, with no people using PDAM in the village. There is a significant relationship between poor water sources and the high percentage of diarrheal diseases in the village community of Indra Jaya District.

Environmental sanitation conditions, especially in MCK (Bathing, Washing, Toilet) practices, can influence the risk of diarrheal disease, especially for people who use river water as a water source. Treating household drinking water, such as boiling, can be an effective measure to prevent diarrhea, especially in environments where clean water cannot be easily accessed.

Increasing public understanding regarding the importance of clean water sources, Environmental sanitation and drinking water treatment practices can play a role in reducing the risk of diarrheal disease. There needs to be attention and action from the government and health officials to increase community access to safe, clean water, as well as carrying out regular sanitation inspections to ensure the safety of water sources. Thus, preventive measures and improving the quality of water sources can potentially reduce the incidence of diarrheal disease in the village community of Indra Jaya District.

REFERENCE

1. Mhd.Hidayattullah, Yulia Y, Balqis P, Rahmah S. Surveillance Of Household Clean And Healthy Behavior (Phbs) In Lam Guron Village, Peukan Bada District, Aceh Besar. ASJo: Aceh Sanitation Journal. 2023;2(1).
2. Republic of Indonesia Ministry of Health. (2022). Clean and Healthy Living Behavior. Jakarta: Republic of Indonesia Ministry of Health
3. Riskesdas, (2022), Presentation of Basic Health Research Results, Indonesian Ministry of Health, Jakarta
4. Department of Health (2022). Methods for Taking Water Samples and Bacteriological Examination of Water. Yogyakarta.
5. Dwipayanti, U. (2020). Determinants of Diarrhea Incidents in Toddlers Based on Pillar 1, 2 and 3 Indicators of the STBM Program in the Banjarangkan II Community Health Center Area, Klungkung Regency, Bali. Health Research Bulletin, 48(4), 271–280.
6. World Health Organization. (2020). Global Strategy for Health for All by the Year 2000. Geneva: World Health Organization.
7. Pasambuna Fila Nur R et al (2016). The relationship between clean and healthy living behavior and the incidence of diarrhea in Gogagoman Village, West Kotamobagu District in 2015. Pharmacon Scientific Journal of Pharmacy-Unsrat. ISSN 2302-2493. Vol 5 No. 1.
8. Sumolang, DT, Tucunan, AAT, & Maramis, FRR (2019). The relationship between providing incentives and leadership and employee performance at Bhayangkara Level III Hospital, Manado. KESMAS Journal, 8(6), 178–185.
9. Suryani, (2021),. Clean water supply. Republic of Indonesia Ministry of Health. Jakarta.
10. Fitrianti A. (2016). Public Health: Sanitation and Environment. Borobudur Inspira Nusantara. Surakarta.
11. Proverawati, A and Rahmawati, E. (2016). PHBS: Clean and Healthy Living Behavior. Noah Medika . Yogyakarta.
12. Zarkasih, (2019). Clean water supply technology. Jakarta
13. Silalahi, N., & Sinambela, RY (2020). Analysis of the Relationship between Community-Based Total Sanitation (STBM) and the Incidence of Diarrhea in Toddlers in Suka Mulia Village, Hinai District, Langkat Regency. Public Health Research Journal, 2(2), 9–17.
14. Nurpauji et al., (2020) Providing clean water. Republic of Indonesia Ministry of Health.
15. Samiyati, M., Suhartono, & Dharminto. (2019). The Relationship between Home Environmental Sanitation and the Incidence of Diarrhea in Toddlers in the Working Area of the Karanganyar Health Center, Pekalongan Regency. Journal of Public Health (e- Journal), 7(1), 388–395.
16. Riskesdas Gorontalo, (2019), Diarrhea prevalence results based on diagnosis by health workers in Indonesia, Gorontalo.