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Analysis of effect strategies in improving water quality diarrhea prevention on Hilibala health center, South Nias district

Erisman Hondro[1], Sri Lestari Ramadhani Nasution[2], Ermi Girsang[3]
[1,2,3]University Prima Indonesia Medan, North Sumatera Indonesia

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ABSTRACT
Hilibala Community Health Center is the largest contributor to diarrhea cases, namely 662 cases. One of the causes is poor water quality. Therefore, this study aims to analyze the effect of health promotion in improving water quality to prevent diarrhea. The location of this research was carried out in the working area of the Hilibala Community Health Center, South Nias Regency. The research will start in June-August 2023. The sample in this study was 99 families and was determined using a purposive sampling formula. There were 6 informants for this research. The data was analyzed univariately, bivariately, and multivariately as well as by theme analysis. The results of the research show that there is an influence of advocacy, partnership, and community empowerment on the role of families in improving water quality as an effort to prevent diarrhea at the Hilibala Community Health Center, South Nias Regency, with the results of statistical tests obtaining a significant p-value for each, namely 0.000 < 0.05. The variable that influences this is the empowerment variable with a p-value of 0.000, OR = 9.333 (95% CI = 3.085), while the strategy used to improve water quality as an effort to prevent diarrhea at the Hilibala Health Center, South Nias Regency is to empower the community, such as working together to find clean water locations, digging wells and maintaining the cleanliness and quality of the water. This research concludes that the right strategy is to increase empowerment as a health promotion strategy in improving water quality to prevent diarrhea at the Hilibala Community Health Center, South Nias Regency. Suggestions for community health centers are to carry out situation analysis, outreach, cadre formation and intervention, and evaluation. The results of community empowerment activities with character building have a good impact, namely that the majority of people have increased understanding. The quality of life of the community will also improve as seen from the reduced number of diarrhea incidents.

Corresponding Author:
Erisman Hondro
University Prima Indonesia Medan, North Sumatera Indonesia
erismanhondro55@gmail.com

INTRODUCTION

Health problems in the environmental sector are one of the 17 goals of the Sustainable Development Goals (SDGs) to improve the level of public health, namely ensuring the availability and management of water and sanitation for all people in a sustainable manner (Sustainable Development Goals, 2017). The SDGs targets are by 2030, achieving

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universal and equitable access to safe and affordable drinking water for all, achieving access to adequate and equitable sanitation and hygiene for all, and ending the practice of open defecation, paying special attention to the needs women, as well as vulnerable groups, improve water quality by reducing pollution, eliminating discharges and minimizing the release of hazardous materials and chemicals, halving the proportion of untreated wastewater, and significantly increasing recycling and reuse of recyclables. globally safe, significantly improve water use efficiency in all sectors, and ensure sustainable use and supply of fresh water to overcome water scarcity, and significantly reduce the number of people suffering from water scarcity, implementing integrated water resource management at all levels, including through appropriate cross-border cooperation as well as supporting and strengthening local community participation in improving water and sanitation management (SDGs, 2017).

Sanitation is one component of environmental health. In application in society, sanitation includes the provision of clean water. Clean water and proper sanitation are basic human needs. The most important changes in sustainable consumption and production will be driven by technology, innovation, product design, detailed policy guidelines, education, and behavioral change.

Based on World Bank data in 2020, it is known that as many as 780 million people do not have access to clean water and more than 2 billion people on earth do not have access to sanitation. As a result, thousands of lives are lost every day and material losses reach up to 7 percent of world GDP. This shows how important water is for human life (World Bank, 2020).

Water is a very useful and beneficial resource for humans. Not only humans, living creatures in the world really need water as a very important element, without water living creatures will not be able to survive. If humans do not have contact with water for a day, many things and factors will definitely be greatly disturbed. Along with population growth, the need for clean water is very important, especially from a health perspective because clean water is already difficult to find. Whether or not a society is progressing in a city or region can be seen from the availability of clean water which is available whenever needed (Yulianti, 2011).

According to Boekoesoe (2010) quality water is water that meets health requirements and can be drunk directly. So that drinking water cannot cause disease, healthy water must have the following requirements: 1) physical requirements, the physical requirements for healthy drinking water are clear (colorless), tasteless, a temperature below the temperature of the outside air; 2) bacteriological requirements, water for healthy drinking purposes must be free from all bacteria, especially pathogenic bacteria. The way to find out whether drinking water is contaminated by pathogenic bacteria is to examine a sample of the water and if 100cc of water is examined, there are less than 4 Escherichia coli bacteria, then the water meets health requirements; 3) Chemical terms, drinking water that contains certain substances in certain amounts. Lack or excess of one chemical substance in water will cause physiological disorders in humans.

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Based on data from the World Health Organization (WHO) in 2022, as many as 2.2 billion people throughout the world continue to suffer from poor access to water, sanitation and hygiene. According to a new report by UNICEF, 4.2 billion people lack safely managed sanitation services, and 3 billion lack handwashing facilities (WHO, 2022).

Based on the WHO/UNICEF joint monitoring program (JMP) for Water Supply, Sanitation and Hygiene is an official United Nations mechanism tasked with monitoring country, regional and global progress, and especially towards Sustainable Development Goals (SDG) targets related to access universal and even. for safe drinking water, sanitation and hygiene. JMP is an authoritative source of internationally comparable estimates referring to policy decision making and resource allocation, especially at the international level and there are some of the highest country burdens regarding clean water shortages namely Angola, Benin, Burkina Faso, Cambodia, Chad, China, Ivory Coast, Democratic Republic of the Congo.

From the results of field studies, it is known that incidents related to environmental-based diseases, one of which is diarrhea due to people's ignorance that consuming unclean water is something that is not good and detrimental to health. So that changes in behavior are needed. Researchers also found that people do not know the negative impacts of using polluted water, therefore efforts are needed to change their knowledge and attitudes, in this case a change in behavior. Behavior changes can be made by implementing health promotion strategies.

Based on the explanation above, it is known that the low level of community behavior, both knowledge, attitudes and actions, needs attention from various sectors, especially health workers. Therefore, health promotion must be increasingly encouraged to improve public health behavior in using high quality water. One strategy for promoting health is to take a family approach. The family approach is one way to increase target reach and bring closer/increase access to health services by visiting families.

The family approach referred to in these general guidelines is a development of home visits by Community Health Centers and an expansion of Community Health Care (Perkesmas) efforts, which include the following activities. 1) Family visits for data collection/collection of Family Health Profile data and rejuvenation (updating) of the database ; 2) Family visits in the context of health promotion as a promotive and preventive effort; 3) Family visits to follow up on health services in the building; 4) Utilization of data and information from the Family Health Profile for community organization/empowerment and Puskesmas management.

Based on the explanation above, it is known that there is no strategy or a health promotion strategy using a family approach has never been implemented to improve water quality to prevent diarrhea at the Hilibala Community Health Center. Therefore, it is necessary to create a health promotion strategy that can increase public awareness to improve water quality as an effort to prevent diarrhea.

The high incidence of diarrhea, one of the causes of which is poor water quality at the Hilibala Community Health Center, needs attention from various groups, especially the people who live in the village. Because based on observations and interviews conducted by

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researchers during the initial survey, it was discovered that the people at the Hilibala Community Health Center did not care much about sanitation and the appropriateness of clean water, which had an impact on decreasing the level of health in the village. Therefore, there is a need for a health promotion strategy to make people aware of the importance of using and consuming clean water.

Literature Review

Health Promotion

According to WHO (in Fitriani, 2011), health promotion is "The process of enabling individuals and communities to increase control over the determinants of health and there by improving their health" (a process that seeks individuals and communities to increase their ability to control health factors so that can improve their health status). Health promotion is a revitalization of health education in the past, where in the concept of health promotion it is not only a process of public awareness in terms of providing and increasing knowledge in the health sector, but also as an effort that is able to bridge behavioral changes, both in society and in the organization and its environment. The environmental changes expected in health promotion activities include the physical-non-physical, socio-cultural, economic and political environments. Health promotion is a combination of various kinds of support, including education, organizations, policies and legislation for environmental change (Mubarak et al., 2007).

Health promotion is a term that is currently widely used in public health and has received policy support from the government in carrying out its activities. The definition of health promotion is also contained in the Decree of the Minister of Health Number 1148/MENKES/ SK/VII/2005 concerning Guidelines for Implementing Health Promotion in Regions, which states that health promotion is "an effort to improve community capacity through learning from, by, for and with the community, so that they can help themselves, as well as develop activities that are community resourced, appropriate to local social culture and supported by public policies that are health-oriented."

The aim of health promotion is to increase the ability of individuals, families, groups and communities to be able to live healthily and develop community-sourced health efforts and create a conducive environment to encourage the formation of these abilities (Notoatmodjo, 2012).

Efforts to realize health promotion can be done through good strategies. Strategy is a method used to achieve the desired goals in health promotion as a support for other health programs, such as environmental health, improving community nutritional status, eradicating infectious diseases, preventing non-communicable diseases, improving maternal and child health, and health services.

Health Behavior

Behavior is what an organism does or what other organisms observe. Behavior is also part of the function of an organism involved in an action. Behavior is a response or reaction to a stimulus (stimulus from outside). Behavior occurs through a response process, so this theory is often called the "S-O-R" theory or Stimulus Organism Theory (Skinner, 1938). An

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organism's behavior is everything it does, including closed and open behavior such as thinking and feeling (Pierce, W. David; Cheney, 2013).

Recent decades have seen increased attention to the contribution of behavior change particularly to improving health. Smoking, excessive alcohol consumption, substance abuse, unhealthy eating habits, a sedentary lifestyle, and non-adherence to effective treatment regimens are among the health-harmful behaviors identified and targeted for modification (Medicine, 2001). Health improvement behavior is the outcome of the Health Promotion Model. In addition to resulting in improved health, healthy behavior can improve functional abilities and a better quality of life at all stages of development (Pender, Murdaugh and Parsons, 2019). The main focus of health promotion is to help people limit unhealthy behavior and replace it with healthy behavior (Glanz, Lewis and Rimer, 2008).

Health behavior is a personal attribute such as beliefs, expectations, motives, values, perceptions, and other cognitive elements, personality characteristics, including affective and emotional states and traits, and patterns of behavior, actions, and overt habits related to health maintenance, health restoration, and improved health (Glanz, Lewis and Rimer, 2008). In this chapter, we will discuss further the concept of behavior, health behavior, and mechanisms for the occurrence of health behavior based on health behavior theory.

Health behavior is the actions of individuals, groups, and organizations including social change, policy development and implementation, improving coping skills, and improving quality of life. Health behavior is also defined as personal attributes such as beliefs, expectations, motives, values, perceptions, and other cognitive elements, personality characteristics, including affective and emotional states and traits, and overt patterns of behavior, actions, and habits related to health maintenance, recovery health, and health improvement.2.3. Teori Perilaku Kesehatan

Diarrhea

Diarrhea is defecation with a soft or liquid consistency, it can even be just water with a frequency more frequent than usual (three times or more) in one day (MOH RI 2011). Diarrhea is defecation in toddlers more than 3 times a day accompanied by a change in stool consistency to liquid with or without mucus and blood that lasts less than one week (Juffrie and Soenarto, 2012).

Diarrhea is a change in stool consistency that occurs suddenly due to the water content in the stool exceeding normal (10ml/kg/day) with an increase in defecation frequency of more than 3 times in 24 hours and lasting less than 14 days (Tanto and Liwang, 2014). Based on the three definitions above, it can be concluded that diarrhea is defecation with increased frequency more than usual, 3 times a day or more with a liquid consistency.

Clean Water

Water for Sanitation Hygiene Purposes is water of a certain quality that is used for daily purposes, the quality of which is different from drinking water (RI Minister of Health Regulation No. 32 of 2017). Recently it has been difficult to get clean water. The reason it is difficult to get clean water is water pollution caused by industrial, household and agricultural waste. Apart from that, the development and looting of forests is the cause of

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the reduction in the quality of spring water from the mountains because it is mixed with mud that is eroded by river water. As a result, clean water sometimes becomes a rare commodity (Asmadi, Khayan and Kasjono, 2011).

The need for clean water is the amount of water needed to meet water needs for daily activities such as bathing, washing, cooking, watering plants and so on. Sources of clean water for daily living needs in general must meet quantity and quality standards (Asmadi, Khayan and Kasjono, 2011).

Viewed from the perspective of public health science, the provision of clean water sources must be able to meet the needs of the community because limited supply of clean water makes it easier for disease to arise in the community. The average volume of water each individual needs per day ranges from 150-200 liters or 35-40 gallons. Water needs vary and depend on climate conditions, living standards and community habits (Chandra, 2012). The average volume of water each individual needs per day ranges from 150-200 liters or 35-40 gallons. Water needs vary and depend on climate conditions, living standards and community habits (Chandra, 2012).

Clean Water Source

According to (Chandra, 2012) water intended for human consumption must come from a clean and safe source. The limits of clean and safe water sources include:

a. Free from contaminants or disease germs
b. Free from dangerous and toxic chemical substances
c. Tasteless and odorless
d. Can be used to meet domestic and household needs.
e. Meet the minimum standards determined by WHO or the Indonesian Ministry of Health.

Water is declared polluted if it contains germs, parasites, dangerous chemicals, and garbage or industrial waste. Water from the surface of the earth can come from various sources. Based on the location of the source, water can be divided into space water (rain), surface water and ground water (Chandra, 2012)

a. Space Water
   Space water or rainwater is the main source of water on earth. Even though the water is the cleanest at the time of precipitation, the water tends to experience pollution when it is in the atmosphere. Pollution that occurs in the atmosphere can be caused by dust particles, microorganisms and gases, for example, carbon dioxide, nitrogen and ammonia.
b. Surface water
   Surface water, which includes water bodies such as rivers, lakes, ponds, reservoirs, swamps, waterfalls and surface wells, mostly comes from rainwater that falls to the earth's surface. The rainwater will then be polluted by soil, rubbish and others.
c. Groundwater
   Ground water comes from rainwater that falls to the surface of the earth which then experiences percolation or absorption into the soil and undergoes a natural filtration process. The processes that rainwater has undergone, on its way

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underground, make the soil better and purer than surface water. Groundwater has several advantages compared to other sources. First, groundwater is usually free from disease germs and does not need a purification or clarification process. Groundwater supplies are also available throughout the year, even during the dry season. Meanwhile, groundwater also has several disadvantages or weaknesses compared to other sources. Ground water contains mineral substances in high concentrations. High concentration of minerals such as magnesium, potassium and heavy metals such as iron.

METHOD

This research is explanatory research, namely using mixed method research, namely a research approach that combines or associates quantitative and then qualitative forms. This approach involves philosophical assumptions, the application of quantitative approaches, and mixing the two approaches in one research. This approach is more complex than simply collecting and analyzing two types of data; it also involves the function of the two research approaches collectively so that the strength of this research as a whole. In this case the data was collected at the Hilibala Community Health Center, South Nias Regency.

The location of this research was carried out in the working area of the Hilibala Community Health Center, South Nias Regency. The location of this research was determined on the basis that the Hilibala Community Health Center, South Nias Regency, based on reports from the local Health Service, is an area that has high cases of diarrhea every year. research to identify further efforts to prevent a research period starts from June-August 2023. With research activities, conducting an initial survey, making a research proposal, conducting research and making a report on research results.

The data collection techniques used in this research use data, namely: Primary data was collected by distributing questionnaires and prepared interview guides.

a. Secondary data was collected by visiting the Hilibala Community Health Center, South Nias Regency by first providing a letter requesting research permission from Prima Indonesia University to be shown as part of research ethics.
b. Tertiary data was obtained through searching related journals, then do citations.

RESULT AND DISCUSSION

Health District.

Hibala District is one of the areas in South Nias Regency, North Sumatra Province, which is located in the Batu Islands Islands area, precisely on Tanahbala Island. The area of Hibala District is 225.75 km2. The distance between the sub-district capital (Eho Village) and the district capital (Teluk Dalam District) is 138 km. The Hibala Community Health Center UPTD is located in Eho Village, Hibala District. Administratively, this health center is part of South Nias Regency, North Sumatra Province.

The working area boundary of the Hibala Health Center UPTD to the north is Hiliotanie Village, to the east is the Mentawai Strait, to the south is the Mentawai Strait, and to the west is Balowabanua Village.

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The working area of the UPTD Hibala Community Health Center is at an altitude of 50-228 m above sea level. The topography of the UPTD Hibala Community Health Center working area is generally an island with sand beaches and hilly land dominated by coconut plantations. The working area of the UPTD Hibala Community Health Center generally has a tropical climate with two seasons, namely the dry season and the rainy season. The rainy season is usually accompanied by the storm season at sea. The storm season usually occurs between August and December.

The working area of the Hibala Health Center UPTD covers 10 villages, namely Eho Village, Bawonifaoso Village, Baruyu Sibohou Village, Sialema Village, Hilikana Village, Hilioromao Village, Tuwaso Village, Sepakat Village, Duru Village, and Tanomukino Village. The distance between each village is ± 1-2 hours by land or sea by foot, using a 2-wheeled vehicle and using a robin (small wooden boat) or speed boat. Access from the district capital (Teluk Dalam) to the sub-district capital (Hibala) is achieved in two stages, namely from Teluk Dalam to Tello Island then continuing from Tello Island to Hibala. From Teluk Dalam to Tello Island can be reached by 2 routes, namely sea and air. The sea route can be reached in + 4-5 hours by ship and + 2-3 hours by speedboat, while the air route can be reached by plane from Gungung Sitoli. From Tello Island to Hibala can only be accessed by sea + 4-5 hours by ship and + 1.5-2 hours by speedboat.

Number of Heads of Family

The number of heads of families in the UPTD Hibala Community Health Center working area, Hibala District, South Nias Regency as of November 2023 is 1,140 heads of families. Details of the number of heads of families in the Hibala Health Center UPTD working area are listed in the following table:

Table 1. Number of Heads of Family

NO	Name Of Village	Head Of Family
1	Eho	237
2	Bawonifaoso	79
3	Baruyu Sibohou	129
4	Sialema	136
5	Hilikana	61
6	Hilioromao	126
7	Tuwaso	116
8	Sepakat	75
9	Duru	79
10	Tanomokinu	102
	Total	1.140

Population Distribution According to Ethnicity/Religion

The distribution of population according to ethnicity/religion in the working area of the UPTD Hibala Community Health Center, Hibala District, South Nias Regency as of November 2023 can be seen in the following table:

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Table 2. Population Distribution According to Ethnicity/Religion

NO	Name Of Village	Etnic Nias	Non- Nias	Religiouns		
				Kristen	Katolik	Islam
1	Eho	233 KK	4 KK	179 KK	54 KK	4 KK
2	Bawonifaoso	78 KK	1 KK	76 KK	0	0
3	Baruyu Sibohou	129 KK	0	95 KK	34 KK	0
4	Sialema	136 KK	0	28 KK	108 KK	0
5	Hilikana	61 KK	0	20 KK	41 KK	0
6	Hilioromao	126 KK	0	73 KK	53 KK	0
7	Tuwaso	116 KK	0	86 KK	29 KK	1 KK
8	Sepakat	75 KK	0	60 KK	15 KK	0
9	Duru	79 KK	0	46 KK	33 KK	0
10	Tanomokinu	102 KK	0	55 KK	42 K	0

Quantitative Data Analysis.

Univariate data analysis in this study was carried out to determine the distribution of health promotion strategies in improving water quality as an effort to prevent diarrhea at the Hilibala Community Health Center, South Nias Regency. The frequency distribution in this study includes: age, gender, education, advocacy, partnership, empowerment, and family role. The distribution of age, gender and education at the Hilibala Community Health Center, South Nias Regency can be seen in the table below:

Table 3. Distribution of Age, Gender and Education at the Hilibala Community Health Center, South Nias Regency

Years	n	%
< 35 tahun	24	24,2
36-45 tahun	50	50,5
> 45 tahun	25	25,3
Gender	n	%
Laki-laki	48	48,5
Perempuan	51	51,5
Education	n	%
SMP	38	38,4
SMA	51	51,5
PT	10	10,1
Total	99	100

Based on table 3 above, it is known that of the 99 respondents, respondents aged < 35 years were 24 (24.2%), aged 35-45 years, namely 50 (50.5%), and those aged > 45 years, namely as many as 25 (25.3%). There were 48 male respondents (48.5%) respondents and 51 of them were female (51.5%) respondents. There were 38 respondents with junior high school education (38.4%) respondents, 51 (51.5%)

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respondents had a high school education, and 10 (10.1%) respondents had a university education.

Qualitative Data Analysis

The subjects of this research were 6 people, with details of 1 health worker who is related to health promotion, especially empowerment as a strategy at the Health Service and Hilibala Community Health Center, South Nias Regency and 3 mothers who have children under three years of age who are in the working area of the Hilibala Community Health Center, Nias Regency. South, 1 head of P2PM. Data was obtained by in-depth interviews, unstructured observation, and document study of activity documents.

Stakeholders

Informants were selected according to predetermined inclusion criteria. The age of the informants ranged from 21-56 years. Based on the position, the informants consisted of one Head of Division, two section heads, one head of the Community Health Center and four employees of the Community Health Center.

Society

The people who became informants were mothers of children under three years old and the children had suffered from diarrhea in the last three months. Based on age, the mothers were between 20-40 years old with the lowest education being elementary school and the highest being a bachelor's degree. The informant's occupation consists of housewife, laborer, employee and teacher. Based on their participation in activities in the community, the informants consisted of mothers who often participated in activities in the community (routinely attending posyandu or other activities every month at least six times a year) and rarely participated in activities in good environments.

CONCLUSION

Based on the research results, there are several conclusions in this research, namely: There is an influence of advocacy in improving water quality on the prevention of diarrhea at the Hilibala Community Health Center, South Nias Regency. The results of statistical tests obtained a significance p value of 0.000 < 0.05. Based on the research results, it is known that advocacy is closely related to the role of the family in improving water quality. If advocacy is not carried out in a structured and continuous manner, then people will continue to use poor quality water as water for their lives. There is an influence of partnerships in improving water quality on the prevention of diarrhea at the Hilibala Community Health Center, South Nias Regency, with the results of statistical tests obtaining a significant p value of 0.000 < 0.05. Based on the research results, it is known that partnerships are closely related to the role of families in improving water quality. The function of this partnership is to encourage the government to synergize with families to continue using clean water, even though it is difficult to find clean water, there are efforts from external parties to provide clean water. There is an influence of empowerment in improving water quality on the prevention of diarrhea at the Hilibala Community Health Center, South Nias Regency. The statistical test results obtained a significant p value of 0.000 < 0.05. Based on the research results, it is known that empowerment is closely

related to the role of the family in improving water quality. This empowerment includes paying attention to the location of the well where the water is clean, or the distance to the septic tank and so on. The community is involved in exploring the potential for clean water in their environment. The strategy used to improve water quality to prevent diarrhea at the Hilibala Community Health Center, South Nias Regency is to empower the community, such as working together to find locations for clean water, digging wells and maintaining the cleanliness and quality of the water.

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