

OVERVIEW OF KNOWLEDGE ABOUT THE FEASIBILITY OF DRINKING WATER SOURCES IN GEMPOL VILLAGE, KARANGANOM DISTRICT, KLATEN

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Track Record Article	Abstract
Accepted: Published:	Water is a basic need for all living things, including humans, who use water for living purposes such as bathing, washing, drinking and other purposes. Poor water quality has an impact on health and can even threaten life. This research aims to describe community knowledge regarding the suitability of drinking water sources in Gempol Village, Karanganom District, Klaten. The research population includes residents of Gempol Village consisting of 18 RTs with a total of 800 Heads of Families (KK). A total of 116 respondents were involved in this research, selected through proportional calculations. Data collection methods involve observation, interviews, and questionnaires, with data analysis using SPSS statistical software. The research results showed that in the frequency distribution of knowledge levels regarding the suitability of drinking water sources, 101 respondents (87.1%) had good knowledge, while 15 respondents (12.9%) had sufficient knowledge. Keywords: Drinking Water, Knowledge, Feasibility of Drinking Water Sources

INTRODUCTION

Water is a basic need for all living things, including humans, who use water for living purposes such as bathing, washing, drinking and other purposes (Citra, 2016, as quoted by Mila et al., 2020). Some living things can live without air, for example anaerobic bacteria, but the survival of living things is determined by the presence of water (Jumini, 2016, as quoted by Mushthofa et al., 2023). According to the World Health Organization (WHO), the water needs of the population of developed countries is 60-120 liters/day and in developing countries the water needs of the population is 30-60 liters/day (Muthaz et al., 2017, as quoted by Zora et al., 2022). Poor water quality has an impact on health and can even threaten life (Sugierster et al., 2021). The presence of coliform bacteria in contaminated water does not always cause disease, but the higher the number of coliform bacteria detected, the greater the risk of disease-causing bacteria. Possible illnesses, such as digestive disorders (diarrhea) and flu, are often associated with contaminated water (Louisiana, 2009, as cited by Asyifiradayati et al., 2023). The role of water in disease transmission is due to its properties that support microbiological life. Water becomes a breeding ground and temporary residence (intermediary) for

microorganisms before infecting humans (Gufran & Mawardi, 2019). Low quality drinking water is one of the factors causing the emergence of cholera, diarrhea and other digestive disorders (Sukartini & Saleh, 2016, as quoted by Putri & Yuniasih, (2022). Based on the Republic of Indonesia Minister of Health Regulation Number 492/Menkes/IV/2010, drinking water that is suitable for consumption must meet chemical, biological and physical requirements. Physical requirements suitable for consumption include clear, tasteless and colorless water. Chemical requirements include low hardness level, neutral pH, and not containing dangerous toxic materials. Meanwhile, the biological requirement is that it does not contain *Escherichia coli* bacteria (Adam, 2019).

The suitability of a water source can be seen from the minimum distance between the water source and the pollutant source of at least 10 meters (Adzura et al., 2021). Several sources of drinking water used by Indonesian people according to Riskesdas 2018 include tap water (14.2%), DAM (Drinking Water Depot) water (13.8%), protected dug wells (24.7%), and drilled/pumped wells (14.0%) (Anamevia et al., 2023). Rural and urban areas have varied sources of drinking water, PDAM water (28.6%) and drilled wells/pumps (32.9%) are widely used in urban areas. Meanwhile, the majority of rural areas use dug wells (32.7%) (Ministry of Health of the Republic of Indonesia, 2010, as quoted by Majdi & Sholehah, (2020). Klaten Regency is geographically located at an altitude of 75-160 meters above sea level, the main water source comes from groundwater (Rasidi & Boediningsih, 2023). Dug wells as a source of drinking water are easily contaminated because the construction of the well walls, well rim, well floor, waste disposal system and absorption pits does not meet health standards. Distances to sources of pollution such as livestock pens, septic tanks, rubbish pits, latrines and SPALs do not comply with health standards (Dappa et al., 2023).

Aspects of the quality and quantity of access to drinking water must be considered. In terms of quality, water must meet drinking water quality standards, while in terms of quantity the water must be able to flow continuously (Ministry of Health, 2023). The Central Statistics Agency (BPS) stated that national household access to drinking water in 2020 was still below 50 percent, namely around 44.94 percent. This means that more than half of households in Indonesia, around 55.06 percent, do not have optimal access to drinking water. Based on this description, researchers conducted research in Gempol Village, Karanganom District, Klaten to determine the description of knowledge regarding the suitability of drinking water sources based on a survey of 10 respondents, it was found that 7 of them did not know the parameters of suitability of drinking water sources.

METHODS

This research is quantitative descriptive research, namely data collected and presented in the form of numbers or calculations, not in the form of explanations or detailed descriptions in sentences. The research was conducted in Gempol Village, Karanganom District, Klaten Regency. Data collection was carried out in November 2023. The research population included the entire population of Gempol Village which was divided into 11 Hamlets, with a total of 18 RTs and 800 Heads of Families (KK). The research sample was 116 respondents taken using proportional sampling technique. The questionnaire used has passed validity and reliability tests, and is declared valid and reliable. Validity and reliability tests were carried out on the questionnaire so that it could be used validly and reliably. Measuring the level of knowledge refers to the concept of Nursalam (2016) as explained byLestari & Solikah (2022). The knowledge level category consists of three groups, namely: (a) If the respondent can answer 76% -100% of the questions correctly from the total answers, it is categorized as good; (b) If the respondent can answer 56% -75% of the questions correctly from the total answers, it is categorized as sufficient; (c) If the respondent can answer less than 56% of the questions correctly from the total answers, it is categorized as inadequate.

RESULTS

The respondents in this study were 116 people who were selected by administering questionnaires directly from house to house. The demographic description of research respondents includes the variables age, gender and level of education. Detailed information regarding respondent demographics can be found in Table 1.

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Table 1 Characteristics of Research Respondents (n=116)

Characteristics	Frequency	Percentage (%)
1ge a. 30 - 35 years old		6.9

b.	36 - 40 years old	8	20.7
c.	41 - 45 years old		21.6
d.	46 - 50 years old	24	22.4
e.	51 - 55 years old		19.8
f.	> 56 years old	25	8.6
		26	
		23	
		10	
Gender			
a.	Man	46	39.7
b.	Woman	70	60.3
Last Education			
a.	College	2	1.7
b.	SENIOR HIGH SCHOOL	83	71.6
		0	0
c.	JUNIOR HIGH SCHOOL	31	26.7
d.	Elementary School		

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Based on the results of the analysis in Table 1, it can be seen that the characteristics of the respondents show that the majority are in the 45 year age range. The lowest age is 31 years, while the oldest is 58 years. The majority of respondents were women (60.3%), and most had a high school graduate (71.6%).

Table 2 Frequency Distribution of Knowledge Level and Feasibility of Drinking Water Sources in Gempol Village, Karanganom District, Klaten

Characteristics	Category		Total	
	Good	Enough		
Knowledge	101	15	116	
Age ¹		7	1	8
	a. 30 - 35 years old	24	0	24
	b. 36 - 40 years old			
	c. 41 - 45 years old	24	1	25
	d. 46 - 50 years old			
	e. 51 - 55 years old	25	1	26
	f. > 56 years old	17	6	23
	4	6	10	

Gender			
a. Woman	55	15	70
b. Man	46	0	46
Last education			
a. College	2	0	2
b. SENIOR HIGH SCHOOL	80	3	83
c. elementary school	19	12	31

Based on table 2, the frequency distribution data on the level of knowledge regarding the appropriateness of drinking water sources shows that 101 respondents (87.1%) were in the good category and 15 respondents were in the sufficient category (12.9%). The distribution of the highest frequency of respondents' good knowledge level was 72.27% in the age group 36 years to 50 years out of 101 respondents in the good knowledge category. Meanwhile, the distribution of the highest frequency of sufficient knowledge levels is in the age group 51-55 years and >56 years. As much The 101 respondents with a good level of knowledge consisted of 54.45% women and 45.54% men. Meanwhile, 12.93% of women had a sufficient level of knowledge out of a total of 116 respondents. Respondents with a high school education level occupied the highest frequency distribution in the good knowledge category, namely 79.20% of the 101 respondents. Meanwhile, respondents with a final education level of elementary school had good knowledge as much as 16.37% and sufficient knowledge as much as 10.34% of the total 116 respondents.

DISCUSSION

One source of water for community life comes from groundwater. Decreased groundwater quality can increase vulnerability to groundwater pollution (Vienastra & Febriarta, 2020, as quoted by Sari & Vienastra, 2021). According to data from the Ministry of Health, 7 out of 10 households in Indonesia consume drinking water contaminated by *Escherichia coli* bacteria. The findings of the Household Drinking Water Quality Study (SKAMRT) in Indonesia in 2020 showed that 31% used refill water, 15.9% used protected dug wells, and 14.1% used drilled/pumped wells (Rokom, 2021, as quoted by Rostiana, 2023). Meeting the needs for

drinking water, washing, cooking, bathing and other needs of the residents of Gempol Village, Karanganom District, Klaten Regency comes from dug wells, PDAM and springs.

The distribution of the questionnaire showed that 55 respondents gave incorrect answers to number 19, which stated that the presence of puddles on the floor around dug wells had an impact on the water quality of dug wells. The results of the answers showed that 47.4% of respondents gave the wrong answer, even though the correct answer should be "correct". The results of data analysis show that overall, community knowledge regarding the suitability of drinking water sources in Gempol Village, Karanganom District, Klaten Regency, is relatively good. A total of 101 respondents (87.1%) had good knowledge, while 15 respondents (12.9%) had sufficient knowledge. Based on the demographic characteristics of respondents, especially based on gender, it is known that 54.45% of female respondents and 45.54% of male respondents have good knowledge, 12.93% of the total female respondents have sufficient knowledge. In accordance with the theory introduced by Notoatmodjo (2018), as explained by Sutrisno et al., (2023) Gender is defined as a biological condition that differentiates women and men. A person's behavior and appearance correspond to their gender. This is in accordance with Moekijat's statement, 1998, as quoted by Mufida et al., (2022) that men tend to have better knowledge than women because of better social skills, have broader activities and knowledge, and have greater opportunities to obtain information because of the activities that accompany them.

Gempol Village residents demonstrate a good level of knowledge regarding the suitability of clean water sources. In the process of acquiring knowledge, age has an important role because it influences a person's ability to understand new information. The age range of respondents in this study ranged from 31 to 58 years. The frequency distribution shows that the level of good knowledge is dominated by the age group 36 to 50 years, reaching 72.27% of the total 101 respondents who have good knowledge. On the other hand, sufficient levels of knowledge were more commonly found in the age group 51-55 years and over 56 years. This indicates that a person's experience and knowledge increases as they get older. The theory put forward by Budiman & Riyanto (2013), as discussed by Khairunnisa et al., (2021), supports this observation. According to this theory, a person's comprehension ability in studying an object and thinking patterns are linear with increasing age. The demographics of respondents from 116 residents of Gempol Village, Karanganom District, Klaten Regency, based on their latest education, can be described as follows: 83 respondents (71.6%) had a high school educational background, 31 respondents (26.71%) graduated from elementary school, and 2 respondents (1.72%) were college graduates. Of the respondents with a high school education, 80

respondents (68.96%) showed a good level of knowledge, while 3 respondents (2.58%) had a sufficient level of knowledge. The frequency distribution shows that respondents with a high school education dominate in the good knowledge category, reaching 79.20% of the total 101 respondents who have good knowledge. 31 respondents attended elementary school, with 19 respondents (16.37%) having good knowledge and 12 respondents (10.34%) having sufficient knowledge. Meanwhile, 2 respondents with a tertiary education level (1.72%) were included in the good knowledge category. This result is strengthened by the statement of Notoadmojo (2007) as quoted by Idamatussilmi et al., (2023) that there are internal and external factors that influence a person's level of knowledge. Internal factors include perception, education, and motivation. External factors include environmental, social, information and culture. The level of education cannot absolutely measure a person's knowledge but is also influenced by the information they obtain. A high level of education does not always mean high knowledge. A person's knowledge about an object also depends on the extent to which he is familiar with the positive and negative aspects of the object. Positive attitudes emerge as more and more positive aspects of an object are known (Wawan & Dewi, 2017, as quoted by Muliawati et al., 2022). Good knowledge regarding the suitability of drinking water sources in Gempol Village has a positive impact on the use of dug well construction types that meet health sanitation requirements. Evidence of this can be found from the physical condition of the dug wells in Gempol Village, where the wall height of the dug well reaches 3 meters, the floor area around the dug well is around 1 meter, and the height of the rim of the dug well is ≥ 70 cm. The walls of the dug well and the floor area around the well are made of cast cement which is watertight. This situation makes it difficult for dug well water to be polluted by seepage that enters through soil pores. As a result, the dug well water remains clear and its quality is maintained. This condition shows that the residents of Gempol Village have implemented dug well construction that meets health standards. These factors together provide protection against contamination of dug well water quality. The walls of dug wells made of cast cement have a low level of permeability, preventing the seepage of water and contaminants from the soil. The use of concrete buisade as a barrier for the walls of dug wells also prevents the soil from collapsing into the well water. Apart from that, the characteristics of the soil in Gempol Village, which does not include mud or sand, also plays a role in maintaining the clarity of dug well water. Turbidity in water is influenced by the presence of organic and inorganic particles. Organic particles can be detritus, microorganisms and plankton, while inorganic particles can be sand and mud. This is confirmed by the results of Hargreaves' research in 1999, as quoted by Suhendar et al., (2020). Research result Yuliansari, (2019) supports this statement that 54.55%

of dug well construction in Jiken Hamlet, Rarang Tengah Village does not meet health standards, namely the dominant wall height of dug wells is < 3 meters, the majority of dug well floor areas are < 1 meter and are not waterproof and 63.64% height of the edge of the dug well < 70 cm.

¹² According to Minister of Health Regulation Number 3 of 2014 concerning Community-Based Total Sanitation (STBM), the minimum distance between a clean water source and a septic tank should be 10 meters. In the Gempol Village area, several drinking water sources (dug wells) have the potential for pollution originating from latrines, household waste disposal (septic tanks), and livestock pens which are < 10 meters from drinking water sources. ⁴ However, liquid pollutants originating from latrines, septic tanks and livestock pens do not affect the quality of drinking water because the walls and floors of dug wells are well constructed. This prevents liquid pollutants from mixing with dug well water. There is also no standing water around the wells dug by the residents of Gempol Village. The high population density in this village causes land to be used intensively for settlement, causing the distance between houses to become closer and the house yards to become narrower. This condition makes some residents build septic tanks near clean water wells in their yards. However, some residents who have quite large yards have built latrines at an adequate distance from dug wells, namely around 15 meters, and septic tanks at a distance of around 24 meters. Top of Form

Based on research results Rahayu et al., (2019) In Jabungan Semarang there is a correlation between several factors, such as the condition of the well floor, the distance between latrines, other sources of pollution, standing water on the floor and around the well, the condition of the Waste Water Disposal System (SPAL), cracks in the well floor, placement of buckets and bucket ropes, condition the walls and rim of the well with the bacteriological quality of dug well water. Other research conducted by Porusia & Asyfirdayati, (2021) Houses in Mulyoharjo, which are not equipped with septic tanks and dispose of waste directly into the river, show lower levels of E.coli well water pollution compared to houses that have septic tanks. Even so, the condition of the river in Mulyoharjo still shows high levels of E.coli. The close distance between the septic tank and the well also increases the potential for well water contamination.

CONCLUSIONS

The residents of Gempol Village showed a good understanding of the suitability of drinking water sources, namely 101 respondents (87.1%) and 15 respondents (12.9%) with sufficient knowledge. The distribution of the highest frequency of respondents' good level of knowledge

was 72.27% in the age group 36 years to 50 years from 101 respondents in the good knowledge category and the distribution of the highest frequency of sufficient level of knowledge was in the age group 51-55 years and >56 years. A total of 101 respondents with a good level of knowledge consisted of 54.45% women and 45.54% men and a fair level of knowledge was 12.93% women out of a total of 116 respondents. Respondents with a high school education level occupied the highest frequency distribution in the knowledge category. good, namely 79.20% of 101 respondents.

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