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THE INFLUENCE OF CLEAN WATER SOURCE, KNOWLEDGE, ATTITUDES AND ACTIONS OF MOTHER'S PERSONAL HYGIENE ON THE INCIDENCE OF DIARRHEA IN TODDLERS IN MEDAN CITY 2023

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ABSTRACT

Diarrhea is a health problem that globally contributes to the death rate of two billion children worldwide, WHO reports more than 525,000 cases in toddlers are caused by diarrhea. Riskesdas 2018 found that the prevalence of diarrhea among toddlers in Indonesia was 73,188 cases. Medan City in 2020 had 4,561 cases of diarrhea and in 2021 there were 18,588 cases of diarrhea in toddlers. To analyze the effect of clean water sources, knowledge, attitudes, and actions of mothers' personal hygiene on diarrhea in toddlers. The type of this research is a quantitative study with a cross-sectional design. Data analysis used multiple logistic regression tests with a sample of 120 mothers with toddlers aged 2-5 years. The variables that had an effect on were the mother's knowledge (p=0.042) and actions (p=0.019) of personal hygiene on the incidence of toddler diarrhea. Meanwhile, clean water (p=0.362) and attitudes (p=0.115) had not effect on the incidence of toddler diarrhea. The variable that has the most influence on the incidence of diarrhea in toddlers in Medan City is the mother's personal hygiene action which has the highest Exp. B value of 2,792. Knowledge and actions of mother's personal hygiene had an influence on the incidence of toddler diarrhea. Further action for officers to be able to carry out health promotion and education regarding basic sanitation and personal hygiene to mothers whose toddlers experience and do not experience.

Keywords: *environmental sanitation, mother's behavior, diarrhea*

INTRODUCTION

The World Health Organization states diarrhea as a disease where we can prevent its spread by consuming and using standard water sources and practicing good sanitation and hygiene, which are applied in everyday life (Usman et al., 2023). Every year, diarrhea contributes to the death rate of two billion children worldwide; more than 525,000 cases in toddlers are caused by diarrhea. The first two years of age are the ones with the highest incidence of diarrhea cases, and this will decrease as the toddler grows (Brooks et al., 2005). This causes diarrheal disease itself to rank second as a disease that causes death in toddlers, including those that can be prevented or given treatment (WHO, 2022). SDG Target 6: Safe drinking water, sanitation, and hygiene are very important for human health and well-being. Drinking unsafe water can damage health through diseases such as diarrhea. Deaths from diarrhea were halved during the Millennium Development Goals (MDG) period of 1990–2015 by providing water and sanitation. This shows that improving drinking water and sanitation services can improve health and reduce deaths from diarrhea (WHO, 2021).

WHO in 2020 explained that 1.2 billion people have access to good water sources with a 30-minute journey time. As many as 282 million people need more than 30 minutes to access a good water source. Sources of water used for daily needs still come from unprotected wells and springs and are used by 368 million people, and 122 million people use surface water such

as lakes, ponds, and rivers without being treated first. Apart from the concern that drinking water sources will be contaminated with feces, chemical contamination risks also deserve concern. Safe and sufficient water to facilitate hygiene practices is a measure that can be used to prevent diarrheal diseases (WHO, 2022).

Riskesdas 2018 found out the prevalence of diarrhea among toddlers in Indonesia 18,225 cases (nine percent) were found in children under 1 year of age, and as many as 73,188 cases (11.5 percent) were found in children ages 1-4 years with cases of diarrhea in the age group. These toddlers can have diarrhea one to two times a year. Diarrhea is an endemic disease in Indonesia, where it has a chance of extraordinary events (KLB) and is generally accompanied by mortality. At least three outbreaks occurred in 2016, which occurred in three districts with an infection rate of 198 people and a total of six deaths (CFR 3.04%) (Kementrian Kesehatan RI, 2018).

In Indonesia, diarrheal disease in toddlers is also ranked second among primary health care's 10 most common diseases. Diarrheal disease is also associated with cases of malnutrition, where diarrheal disease is a factor causing malnutrition characterized by a reduced ability to absorb nutrients from food. If this continues for a long time, it will disrupt the growth and health of children (Case et al., 2005). The prevalence of generalized diarrhea is different in various age groups, but the prevalence at the age of 1-4 years is the highest at 16.7%, followed by children under 1 year at 16.5% (Fishman et al., 2004)

Medan City in 2020, there were 4,561 cases of diarrhea in toddlers, with the highest sub-districts being Medan Labuhan, Medan Kota, Medan Sunggal, Medan Selayang, and Medan Petisah. The number of these cases increased in 2021, with as many as 18,588 cases of diarrhea in toddlers, with the five highest sub-districts in 2021 being Medan Perjuangan, Medan Belawan, Medan Deli, Medan Labuhan, and Medan Amplas. In 2020, the percentage of clean water facilities in Medan City with low and medium risk was found at 846 sources, with Medan Perjuangan having the most in sub-districts (Dinas Kesehatan Kota Medan, 2020). Based on the survey, the number of cases of diarrhea among toddlers in Medan City from January to June 2022 reached 926 cases in 21 sub-districts. Based on the interviews in October 2022 with 25 mothers who have toddlers, 18 toddlers (72%) experienced diarrhea in the last month, and seven toddlers (28%) did not experience diarrhea in the last month. Personal hygiene mothers found as many as 19 people (76%) did not wash their hands with soap before giving food to children and when preparing food. As many as 22 mothers (88%) did not teach their children to wash their hands before eating snacks. Other things included in this personal hygiene are paying attention to cleanliness, especially when breastfeeding infants; using water in daily life; the habit of washing hands before and after activities, especially when hands are still dirty when feeding children; not washing hands after defecating; and littering (Wall, 2001).

METHOD

Study Design

This research is an analytic survey with a cross-sectional study design. This study was designed to examine the impact of risk factors for diarrhea on toddlers in the form of risk factors for sources of clean water, knowledge, attitudes, and actions of the mother's personal hygiene, and all of them were examined together. The population of this study was all mothers in Medan

who had toddlers aged 24-59 months. The sample in this study was toddlers aged 24-59 months and mothers who had toddlers aged 24-59 months in seven districts in Medan City, which were part of the population taken in a certain way. The sampling process was carried out in two stages.

Data Analysis

In the first stage, the sample was determined by taking thirty percent of all districts in Medan city (Gay, 1992). There are a total of 21 sub-districts in Medan City; seven sub-districts make up thirty percent of the sample, which was taken with the ranking of diarrhea cases from January to June 2022, and the result is Medan Amplas, Medan Perjuangan, Medan Labuhan, Medan Barat, Medan Deli, Medan Belawan, and Medan Denai. Second stage. Determine the number of samples per district with the sample size formula using the Lemeshow formula (1997), and the result is 120 samples. Sampling technique in this research uses the purposive sampling method with inclusion criteria as follows: toddlers aged 24-59 months in the sub-districts of Medan Amplas, Medan, Perjuangan, Medan Labuhan, Medan Barat, Medan Deli, Medan Belawan, and Medan Denai, and houses with PDAM and non-PDAM sources of clean water.

This research instrument used checklists and interviews regarding demographics, the prevalence of diarrheal diseases, sources of clean water, the existence and use of latrines, waste management (observational), and a mother's behavior, including knowledge, attitudes, and actions. This research was conducted by using a simple logistic regression statistical test for bivariate analysis to ascertain the influence between the two variables concerned, the independent variable and the dependent variable. Multivariate analysis, screening was performed on a bivariate analysis to determine whether or not it was necessary to include it in a multivariate analysis; the inclusion criterion is that it must have a p value of less than 0.25. Multiple logistic regression tests are used to determine which variable has the most significant effect.

RESULTS AND DISCUSSION

Table 1 show the distribution of respondents based on the characteristics of respondents in the city of Medan was obtained based on the age of the respondents, mostly in the early adult category, with as many as 72 respondents (60%); the most recent educational background of the respondents being high school (SHS), with as many as 68 respondents (56.7%); and based on occupation, the majority of respondents were housewives with a total of 89 respondents (74.2%). Based on the age of the toddlers, the majority were 2 years old, as were as many as 63 respondents (52.5%) and based on the incidence of diarrhea in toddlers, 61 respondents (50.8%) had diarrhea in the last month.

Table 1
Characteristics of Respondents by Age, Education, Occupation, Clean Water Source, Diarrhea

Variable	n	%
Age		
Late Teenager (>25 year)	25	20.8
Early Adult (25-35 year)	72	60
Late Adult (36-45 year)	20	16.7
Early Elderly (>46 year)	3	2.5
Education		
JHS	11	9.2
SHS	68	56.7
College	41	34.2
Occupation		
Non-Housewife	31	25.8
Housewife	89	74.2
Children Age		
2 years old	63	52.5
3 years old	21	17.5
4 years old	20	16.7
5 years old	16	13.3
Diarrhea		
Yes	61	50.8
No	59	49.2

Univariate Analyze

Based on table 2 it can be seen that the level of knowledge of the respondents is mostly in the middle category, with as many as 98 respondents (81.7%); the attitude of the most respondents is in the middle category, with as many as 109 respondents (90.8%); and the most respondents' actions are in the middle category, with as many as 95 respondents (79.2%). Based on clean water facilities, 60 respondents (50%) used PDAM.

Table 2

Distribution of Clean Water Source, Knowledge, Attitude and Action of Mother's Personal Hygiene

Variabel	N	%
Clean Water Source		
Pam	60	50
Non-Pam	60	50
Knowledge		
Low	22	18.3
Middle	98	81,7
Attitude		
Middle	109	90.8
Good	11	9.2
Actions		
Middle	95	79.2
Good	25	20.8

Bivariate Analyze

Based on table 3 show that the variables that have an influence on the incidence of diarrhea are knowledge (p = 0.028) and action (p = 0.013) of the mother's personal hygiene behavior. These variables will be analyzed in a multivariate manner with the criteria of having a p value of less than 0.25.

Table 3

The Influence of Clean Water Source, Knowledge, Attitudes, and Actions Of Mother's Personal Hygiene On The Incidence Of Diarrhea In Toddlers

Variable	Exp.B	Koef (B)	p
Clean Water	0.716	0.334	0.362
Knowledge	3.141	1.144	0.028
Attitude	3.033	1.109	0.115
Action	3.387	1.220	0.013

Multivariate Analyze

Based on table 4 in the first stage, it was found that after personal hygiene knowledge and actions were included in the multivariate analysis, it turned out that the knowledge variable had a value of p> 0.05, so the next stage of the test was carried out by removing variables with a value of p> 0.05. For knowledge (p = 0.034), there was a change in OR > 10% on the action variable (21.3%), so the knowledge variable was re-entered into the model. The personal hygiene action variable has the largest Exp. B value of 2,792, meaning that personal hygiene measures are the most influential variable or the dominant factor in this study. Furthermore, the results of the multivariate analysis above were entered into the multiple logistic regression equation model to identify the probability of the occurrence of diarrhea as follows:

$$p = \frac{1}{1 + 2{,}7^{-(-0.944+0.899+1{,}027)}}$$

$$p = 72\%$$

Based on the equation above, it is known that if the mother has low personal hygiene knowledge and poor personal hygiene practices, then the probability of her toddler experiencing diarrhea is 72%.

Table 4

Multivariate

Stage	Variable	Exp.B	Koefisien (B)	p	Perubahan OR
1	K	0.389	-0.944	0.034	
	Knowledge	2.456	0.899	0,092	
	Action	2.792	1.027	0.041	
2	K	0.389	-0.944	0.034	
	Action	3,387	1.220	0.013	21.3%

The source of clean water has no effect because the researchers found that 67.5% of the drinking water sources of respondents used gallons of water as a source of drinking water, while clean water was used for bathing, washing, toilet needs, and also for washing raw food ingredients before processing, so this became one of the factors that reduce the transmission of diarrhea through clean water in the city of Medan. The Guideline for Management of Diarrhea explains that people who have access to clean water supply have a smaller risk of suffering from diarrhea compared to people who do not have access to clean water. Communities can avoid transmission of diarrhea by using safe and protected clean water, as well as shelter and storage that comply with health requirements, especially if this clean water will be used as a source of drinking water as well. If not, the community can avoid exchanging diarrhea by using safe clean water for washing hands and washing groceries (Kementrian Kesehatan Republik Indonesia, 2018). This research is in line with Lubis's research in Karo (2022), which stated that there was no effect of clean water facilities on the incidence of diarrhea in nursing infants in settlements after the Sinabung eruption in Karo. This research is in line with Zara and Fitriany's research (2021) in Tanah Pasir Aceh, with the results that there is no relationship between the quality of clean water and the incidence of diarrhea in toddlers. However, this research is not in line with the research of Irfan and Delima (2018).

According to Erfandi (2009), one of the causes that can affect one's knowledge is education. Education will affect the process of thinking and learning, so it will be easier to receive information. If health information is received, the more you eat, the more knowledge you will gain. This can be seen from the results of the study, which showed that 56.7% of mothers had completed high school education, so their mindset and knowledge were considered good. However, in the study, there were still 34.2% of mothers who did not know the causes of diarrhea, 52.5% of mothers did not know about family latrines, and 35.9% of mothers did not know the requirements for clean water. Knowledge of basic sanitation and personal hygiene is certainly the basis for mothers to behave with good personal hygiene; low knowledge of mothers can be a factor that causes toddlers to easily contract diarrhea. This

research is in line with Cahyani's research (2023) in Palu City: there is a relationship between mother's knowledge and the incidence of diarrhea in toddlers. This research is in line with Toyibah's research (2019) in Palembang, with the result that there is a relationship between knowledge and the incidence of diarrhea in toddlers. Attitudes, beliefs and actions can be measured. Attitude is not yet an action or activity but a predisposition to behavior; it is still a closed reaction that becomes a readiness to react to objects in a particular environment. In this study the attitude of respondents was negative where 58% of respondents did not agree that open defecation could cause disease and environmental pollution, there were still 37.5% of mothers who did not agree and 7.5% of mothers did not agree to wash their hands with soap before eating. According to the Ministry of Health (2007), washing hands with soap is an important process for babies, children, food servers, and people who care for children, as it is known that washing hands with soap is one of the cheapest alternatives to preventing toddler diarrhea. This research is in line with research by Fauzi et al. (2020) in Bengkulu, with the result that there is a relationship between a mother's attitude and the incidence of diarrhea in toddlers. This research is in line with Cahyani's research (2023) in Palu City, where there is no relationship between a mother's attitude and the incidence of diarrhea in toddlers.

A person's actions are influenced by knowledge and attitudes; actions are also a response to a stimulus in a real or open form (Heilman & Stopeck, 1985). Things that can be influenced by this community action are the level of education, community habits, facilities, and infrastructure. The majority of respondents in this study were at the moderate level of action (79%) where this was indicated by some of the community's personal hygiene habits, as there were still 53.3% of respondents who rarely sterilized their children's milk bottles, and 70.8% of respondents sometimes kept cutlery in a closed place. This is a factor in the transmission of diarrhea in toddlers, where the mother's actions are very influential. This research is in line with Cahyani's research (2023) in Palu City, with the result that there is a relationship between mothers' personal hygiene measures and the incidence of diarrhea in toddlers. This research is in line with the research of Indran and Wayan (2018), which states that there is a relationship between mothers' personal hygiene measures and the incidence of diarrhea in toddlers.

CONCLUSION

Knowledge and Actions Personal hygiene has an influence on the incidence of diarrhea in toddlers in Medan City; knowledge ($p = 0.042$); and actions ($p = 0.019$). The personal hygiene action variable has the highest Exp.B value, namely 2.792, meaning that personal hygiene measures are the most influential variable or dominant factor in this study. If the mother has low personal hygiene knowledge and poor personal hygiene practices, the probability of her toddler experiencing diarrhea is 72%.

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