Risk Factor Analysis of Diarrhoea Incidence in Children In Riverine and Inland Areas (Analytic Study in Banjar District)

Rudi Fakhriadi*, Noor Ahda Fadillah*,

*Department of Epidemiology Faculty of Medicine, Lambung Mangkurat University
Email correspondence : rudi fakhriadi@ulm.ac.id

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Abstract- Diarrhea disease is a disease characterized by changes in the shape and consistency of soft to liquid stools and an increase in the frequency of more than three times a day. Until now, Diarrhea disease is still a global health problem, especially in developing countries. The magnitude of the problem can be seen from the high morbidity and mortality rates due to diarrhea. WHO estimates that 1.7 billion cases of childhood diarrhea occurred in the world, in 2019 as many as 525,000 children under five died from diarrhea. Banjar Regency is an area that is passed by many rivers, especially the Martapura and Barito Rivers, and according to the 2018 Riskesdas data, Banjar Regency has the highest diarrhea prevalence with diarrhea prevalence in Banjar Regency exceeding 25.35%. This study aims to examine the model of diarrhea transmission in children in the mainland and river areas of Banjar District, South Kalimantan. This study used an analytic observational design with a cross sectional approach. The results showed that there were risk factors for diarrhea in children in the mainland area were knowledge and hand washing behavior ($p < 0.05$). And in the riverbank area the variables associated with the riverbank area are education, knowledge, hand washing behavior, water availability, and type of latrine ($p < 0.05$).

Index Terms- diarrhea, education, knowledge, clean water, latrine

I. INTRODUCTION

Diarrhea disease is a disease characterized by changes in the shape and consistency of soft to liquid stools and an increase in the frequency of more than three times a day. Until now, Diarrhea disease is still a global health problem, especially in developing countries. The magnitude of the problem can be seen from the high morbidity and mortality rates due to diarrhea. WHO estimates that 1.7 billion cases of diarrhea in children occur in the world, in 2019 as many as 525,000 children under five who died from diarrhea. (WHO, 2022).

Diarrhea diseases often affect infants and toddlers, if not addressed further will cause dehydration resulting in death. The latest data from the Ministry of Health shows that diarrhea is the first killer disease in infants and toddlers in Indonesia after pneumonia with a proportion of 47.41% deaths. (Ministry of Health, 2020)

South Kalimantan is an area surrounded by many rivers so that the culture of its people depends on the river. In addition, the prevalence of diarrhea in South Kalimantan is quite high, data from the Indonesian Health profile in 2020 shows that the prevalence of diarrhea in South Kalimantan is 20.1%.(Ministry of Health, 2020)

Banjar Regency is an area that is passed by many rivers, especially the Martapura River and the Barito River, and according to the 2018 Riskesdas data, Banjar Regency has the highest diarrhea prevalence with diarrhea prevalence in Banjar Regency exceeding 25.35% (Riskesdas, 2018).

The life of the Banjar people in South Kalimantan is closely related to river culture as reflected in traditional Banjar settlements that are located on the banks of the river and whose daily activities depend on the river. Historically, the river has been the center of growth, the route of movement and the main transportation infrastructure until now. Activities and life are oriented towards the river so that the river has a very important role and meaning for the Banjar people.(Wajidi, 2012)

Along with the growth of the city and the increase in population, new settlements developed uncontrollably along the river, so that some rivers lost their function and decreased their environmental quality. The river culture that characterizes the community along the river has shifted due to changes in settlement orientation from river communities to mainland communities, resulting in damage to the settlement environment on the riverbanks. One of the impacts of the decline in environmental quality along the riverbanks is the increase in cases of Diarrhea diseases in the riverbank areas.(Wajidi, 2012).

Diarrhea disease in children is caused by several factors including the age of the child, immunization, exclusive breastfeeding, water sources, latrine use, hand washing habits, maternal knowledge, social and economic aspects. Based on the above background, researchers are therefore interested in conducting research on the analysis of differences in risk factors in the Puskesmas area on the mainland and the Puskesmas area on the riverbank in Banjar District.

II. RESEARCH METHODS

This study was an analytic observational study with a cross sectional research design, to determine the risk factors for the incidence of Diarrhea disease in children in Banjar district. The study population was all infants and children in Banjar District. The samples were children in Sungai Tabuk sub-district and West Martapura sub-district with 100 children in West Martapura and 100 children in Aluh-aluh health center. Questionnaires and observation sheets to measure risk factors for diarrhea in children. The independent variables are age, nutritional status, education, drinking water source, type of latrine, garbage and waste disposal. The dependent variable was the incidence of diarrhea in Sungai Tabuk sub-district.

The data collected was immediately edited to check the completeness of the data and its correctness. Furthermore, the data were tabulated and analyzed using the chi-square test with a 95% confidence degree and then continued with the multivariate regression test with a 95% confidence degree.

III. RESULTS AND DISCUSSION

This study was conducted at the Martapura 1 Puskesmas work area which represents the mainland area and the Aluh-Aluh Puskesmas area to represent the riverbank area. The total number of respondents obtained was 206 respondents which were divided into 103 respondents at the Martapura 1 Puskesmas area and 103 respondents at the Aluh-Aluh Puskesmas. Based on the results of the study, the characteristics of the research respondents were as follows:

Table 5.1 Characteristics of Research Respondents in mainland and riverbank areas in 2022.

No.	Variables	Mainland		Riverbank	
		Frequency	%	Frequency	%
1	**Education**				
	Low	63	61,16	50	48,54
	High	40	38,84	53	51,46
2	**Revenue**				
	Low	60	58,25	54	52,43
	High	43	41,75	49	47,57
3	**Knowledge**				
	Low	48	46,60	46	44,66
	High	55	53,40	57	55,34
4	**immunization**				
	Incomplete	38	36,89	53	51,45
	Complete	65	63,11	50	48,56
5	**Handwashing Behavior**				
	Not so good	43	41,74	40	38,83
	Good	60	58,26	63	61,17
6	**Clean Water**				
	Not Eligible	21	20,38	40	35,39
	Eligible	82	79,62	73	64,61
7	**Latrine Type**				
	Not Eligible	29	28,15	46	44,66
	Eligible	74	71,85	57	55,34
8	**Waste Management**				
	Not Eligible	37	35,92	48	46,60
	Eligible	66	64,08	55	53,40
9	**Waste Management**				
	Not Eligible	93	90,29	87	84,46
	Eligible	10	9,71	16	15,54

Based on table 5.1, it is known that in the mainland area the most problematic variable is waste management, which is more on open waste. Whereas in the riverbank area the problematic variables are immunization, clean water, types of latrines, garbage and waste. The type of latrine most often used in riverbank areas is the cemplung latrine, the water used for daily needs is river water, and the waste used by the community is open channel wastewater.

Table 5.2 Results of bivariate analysis of factors associated with the incidence of diarrhea in children in mainland areas (Urban) in 2022

No.	Variables	Incidence of Diarrhea				P-value
		Diarrhea	%	Healthy	%	
1	Education					
	Low	12	19,1	51	80,9	0,315
	High	11	27,5	29	72,5	
2	Revenue					
	Low	13	21,6	47	78,4	0,848
	High	10	23,3	33	76,7	
3	Knowledge					
	Low	15	31,2	33	68,8	0,042*
	High	8	14,5	47	85,5	
4	immunization					
	Incomplete	10	26,3	28	73,7	0,457
	Complete	13	20	52	80	
5	Handwashing Behavior					
	Less Good	14	32,6	29	67,3	0,034*

	Good	9	15	51	85	
6	Clean Water					
	Not Eligible	4	19	17	81	0,685
	Eligible	19	23,1	63	76,8	
7	Latrine Type					
	Not eligible	9	31	20	69	0,184
	Qualified	14	18,9	60	81,1	
8	Waste Management					
	Not eligible	10	27	27	73	0,391
	Qualified	13	19,7	53	80,3	
9	Waste Management					
	Not eligible	20	21,5	73	78,5	0,539
	Qualified	3	30	7	70	

Based on table 5.2, it is known that maternal knowledge is related to the incidence of diarrhea in children with a p value = 0.042 (p < 0.05). Notoatmodjo (2007) states that, knowledge or cognitive is a very important domain for the formation of a person's actions. Before diarrhea occurs in toddlers, we can prevent it through clean and healthy living behavior (Suraatmaja, 2010). Children's health is mainly influenced by the behavior of the people around them. How they manage their environment, becomes the health status of the environment, which determines the health of the baby, especially because the baby spends most of his time in the environment (Soemirat, 2011).

In addition to knowledge, hand washing behavior is also associated with the incidence of diarrhea in toddlers on the mainland with a p value = 0.034 (p < 0.05). This study is supported by the Ministry of Health's theory that habits related to personal hygiene that are important in the transmission of diarrhea germs are hand washing. Washing hands with soap, especially after defecation, after removing children's stool, before preparing/feeding food, and before eating has a positive impact on reducing the incidence of diarrhea. However, the lack of awareness of hygiene in everyone leads to widespread cases of diarrhea. The culture of washing hands with soap before or after doing activities is a means of avoiding Diarrhea diseases.

Table 5.3 Factors associated with the incidence of diarrhea in children in the riverbank area

No.	**Variables**	**Incidence of Diarrhea**				**P-value**
		Diarrhea	**%**	**Healthy**	**%**	
1	Education					
	Low	17	34	33	66	0,0003*
	High	3	5,6	50	94,6	
2	Revenue					
	Low	11	20,4	43	79,6	0,797
	High	9	18,4	40	81,6	
3	Knowledge					
	Low	13	28,3	33	71,7	0,041*
	High	7	12,3	50	87,7	
4	Immunization					
	Incomplete	10	18,8	43	81,2	0,884
	Complete	10	20	40	80	
5	Handwashing Behavior					
	Not so good	12	30	28	70	0,031*
	Good	8	12,7	55	87,3	
6	Clean Water					
	Not Eligible	11	35,5	29	64,5	0,006*
	Eligible	9	12,5	64	87,5	
7	Latrine Type					
	Not eligible	14	30,4	32	69,6	0,011*
	Qualified	6	10,5	51	89,5	
8	Waste Management					
	Not eligible	11	22,9	37	77,1	0,401
	Qualified	9	16,4	46	83,6	
9	Waste Management					
	Not eligible	17	19,5	70	80,5	0,941

	Qualified	3	18,7	13	81,3	

Based on table 5.3 it is known that there are 5 (five) variables associated with the incidence of diarrhea in toddlers. The level of education of parents is associated with the incidence of diarrhea in children with a value of p = 0.0003 (p < 0.05), the level of education plays an important role in the health of a society. consider and analyze the consequences that occur. The results of this study are in line with the research of Hoirunisa Fathia et al (2015) The relationship between the level of education and knowledge of mothers with the incidence of diarrhea which states that there is a relationship between the level of maternal education with the incidence of diarrhea. The p value (0.001) Low maternal education will make it difficult for them to be informed about the importance of personal hygiene and environmental sanitation to prevent the outbreak of infectious diseases, including diarrhea.

Maternal knowledge is related to the incidence of diarrhea in children with a p value = 0.041 (p < 0.05). Notoatmodjo (2007) states that, knowledge or cognitive is a very important domain for the formation of a person's actions. Before diarrhea occurs in toddlers, we can prevent it through clean and healthy living behavior (Suraatmaja, 2010). Children's health is mainly influenced by the behavior of the people around them. How they manage their environment, becomes the health status of the environment, which determines the health of the baby, especially because the baby spends most of his time in the environment (Soemirat, 2011).

Hand washing behavior is also associated with the incidence of diarrhea in toddlers on the mainland with a p value = 0.03 (p < 0.05). This study is supported by the Ministry of Health's theory that habits related to personal hygiene that are important in the transmission of diarrhea germs are hand washing. Washing hands with soap, especially after defecation, after removing children's stool, before preparing/feeding food, and before eating has a positive impact on reducing the incidence of diarrhea. However, the lack of awareness of hygiene in everyone leads to widespread cases of diarrhea. The culture of washing hands with soap before or after doing activities is a means of avoiding Diarrhea diseases.

The factor of available clean water is also associated with the incidence of diarrhea in toddlers with a p value = 0.006 (p < 0.05) The availability of clean water sources is one of the efforts to improve health status. Environmental health includes water health, namely securing and determining the quality of water for various needs and human life. Thus the water used for daily purposes in addition to meeting or covering in quantity must also meet the quality that has been determined. Water can act as a transmission of a disease through microorganisms transmitted by water (water borne disease) or equipment that is washed with water (water washed disease).

The results of this study are in line with research conducted by I Made Subhawa Harsa (2019) The relationship between water sources and the incidence of diarrhea states that there is a relationship between water sources and the incidence of diarrhea. This is because most diarrhea is caused by bacterial infections transmitted by fecal-oral means.

The latrine type factor is also associated with the incidence of diarrhea in toddlers with a p value = 0.011 (p < 0.05). The results of this study are in line with research conducted by Saktha Yudha et al (2019) which states that there is a relationship between family latrines and the incidence of diarrhea. The p value is (0.001). Because in his research shows more than half of the respondents who do not have latrines, especially those that do not meet the requirements. With the condition of family latrines that do not meet the requirements, it can cause the incidence of diarrhea in toddlers due to feces that are not buried tightly will invite flies and rats which will have an impact on environmental health.

The results of the path analysis for variables associated with the incidence of diarrhea in toddlers in the mainland area are as follows:

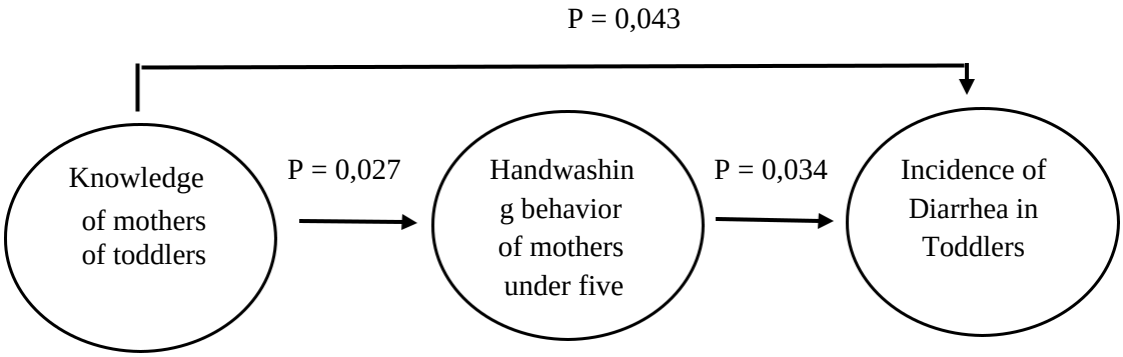

Figure 5.1. Results of Path Analysis Model of Diarrhea Disease Incidence in Toddlers Based on Figure 5.1, it is known that maternal knowledge is directly related to the

incidence of diarrhea in toddlers with a p value = 0.043. However, maternal knowledge is also associated with hand washing behavior with a p value = 0.027 and hand washing behavior is associated with the incidence of diarrhea in toddlers = 0.034.

As for the results of path analysis of factors associated with the incidence of diarrhea in toddlers in the riverbank area as follows:

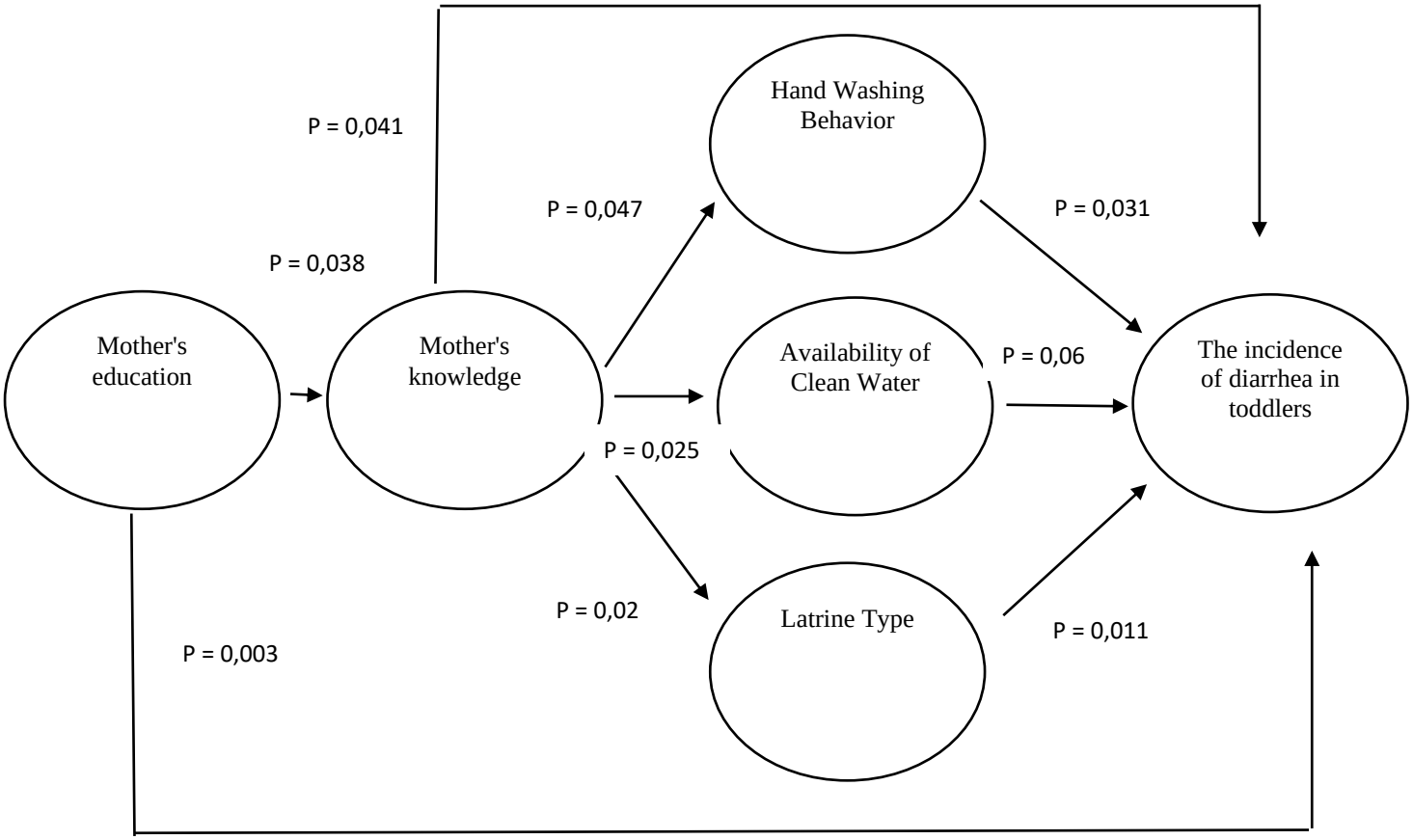

Figure 5.2 Results of Path Analysis Factors associated with the incidence of diarrhea in toddlers in riverbank areas

Based on Figure 5.2, it is known that the earliest variable to cause diarrhea in children is mother's education, then education will affect knowledge, and from knowledge will affect hand washing behavior, water availability, and type of latrine and will cause diarrhea in toddlers in the riverbank area.

VI. CONCLUSION

Based on the research results, it is concluded that :

1. In the mainland area, the influential variables are maternal knowledge and maternal hand washing behavior.
2. In the riverbank area, the influential variables are mother's education, mother's knowledge, mother's hand washing behavior, water availability, and type of latrine.

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AUTHORS

First Author – Rudi Fakhriadi, Department of Epidemiology Faculty of Medicine, Lambung Mangkurat University, rudifakhriadi@ulm.ac.id
Second Author – Noor Ahda Fadillah, Department of Epidemiology Faculty of Medicine, Lambung Mangkurat University, noorahdafadillah@gmail.com

Correspondence Author – Rudi Fakhriadi, rudifakhriadi@ulm.ac.id, +62 813-4947-4044