



Analysis Factors of Diarrhea Incidentin Toddlers At Purwodadi District Health Centre, Grobogan.

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Abstract

Diarrheal is an endemic disease in Indonesia and also become disease with extraordinary events which accompanied by death. There are many factors that can influence diarrhea, such as personal hygiene, environmental sanitation, children's nutritional status, and parental knowledge. The purpose of this study was to analyze the factors that influence the incidence of diarrhea in infants in Purwodadi I Health Center Grobogan. This research was a quantitative study, with a case control approach. The research sample was 92 samples with a purposive sampling technique. The instrument used questionnaires and observations. Data collection techniques of structured interviews used questionnaires, and observation sheets. Statistical analysis used Multiple Logistic Regression. The results found that the most influential variable among the other variables was maternal knowledge with $p = 0,000$. Whereas, the calculation of regression found that there is an influence on the age of mother $p = 0.014$, hand washing habit of mother $p = 0.003$, hand washing habit of toddler $p = 0.019$, and mother's knowledge $p = 0,000$ on the incidence of diarrhea in infants. The variables which are the main predictors in this study are the age of the mother, the skills of washing hands of mother, skills to wash the toddler's hands and mother's knowledge.

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INTRODUCTION

According to WHO's data, there are almost 1.7 billion cases of diarrhea that occur in children with diarrhea that causing deaths reached 525,000 per year in children under five each year (WHO, 2017). There were 13.7% of children under five have diarrhea within two weeks. The highest prevalence of diarrhea is in children aged 12-23 months, followed by ages 6-11 months and aged 23-45 months. Diarrhea affects many groups of 6-35 months because children start playing actively and are at risk of infection (Ariani 2016). In Indonesia, the highest infectious diseases among children under five are diarrhea, which reaches 12.3%, then ARI and malaria (Ministry of Health, Republic of Indonesia, 2018).

Diarrheal disease is one of the causes of mortality and morbidity among children, especially in low and middle income countries. Diarrhea is responsible for 15% of all deaths in children under the age of five and is a leading cause of child death (Thiam *et al.* 2017). Currently morbidity of diarrhea in Indonesia reaches 195 per 1000 population and this figure is the highest among countries in Southeast Asia. Diarrhea is also still an important health problem in Indonesia even though its mortality rate has dropped sharply, but the morbidity rate is still quite high. The incidence of diarrhea in Indonesia, according to a morbidity survey conducted by the Ministry of Health in 2013 ranged from 200-374 per 1000 population. Every toddler on average suffers from diarrhea one to two times a year (Ministry of Health of Indonesia, 2013).

Diarrheal disease is an endemic disease in Indonesia and is also a potential disease of Extraordinary Events which is often accompanied by death. In 2016, cases of diarrhea in Indonesia reached 6,897,463 cases and diarrhea was handled by only 2,544,084 cases, with the highest cases being the province of West Java with 1,761,159 cases with diarrhea being handled in 930,176 cases, then the East Java province with diarrhea as many

as 1,048 cases. 881 cases with diarrhea were handled at 338,806, followed by the province of Central Java with 911,901 cases with diarrhea handled 95,635 cases (Ministry of Health Republic of Indonesia, 2017).

The number of cases of diarrhea discovery in Central Java province every year always increases. The proportion of diarrhea cases in Central Java in 2015 was 67.7% and mostly are women, it is caused that women are more associated with risk factors for diarrhea, which is transmitted through oral vesals, mainly related to clean water facilities, ways of serving food and healthy life habits. The regency was ranked 28th in the highest case finding of 32.6%, diarrheal disease was one of the main causes of illness for infants and toddlers in the Grobogan district. Diarrhea cases in 2012 reached 14,444 cases, in 2013 became 20,691 cases and in 2014 were 30,225 and handled by 12,488 cases or 42% and in 2015 reached 28,919 cases and hadled by 9,319 or only 32.2%, the incidence of diarrhea decreases but diarrhea is still a major cause of illness in infants such as pneumonia, tuberculosis, tetanus, polio, measles, dengue fever, malaria and filariasis (Health Office of Grobogan District, 2015).

Mandasari *et al.* (2018) showed that the availability of latrines in the coastal area of Sitobondo contributed to the occurrence of diarrhea cases $p = 0.020$. Beside that, nutritional status also affects the occurrence of diarrhea with $p = 0.006$. This research is supported by Rohmah and Fariani (2017) found that there is a significant relationship between the use of healthy latrines and hand washing habits $p = 0.014$ and $p = 0.006$ with the incidence of diarrhea in infants.

Research by Oloruntoba *et al.* (2014) shows that factors significantly associated with diarrhea are poor sanitation or water treatment $p = 0,000$. It was also a blocked drainage near the house $p = 0,000$, animal breeding places $p = 0.005$ and drinking water treatment with $p = 0.029$.

Ghasemiet *al.* (2013) showed that maternal age and maternal knowledge had a

significant relationship with the incidence of diarrhea with $p = 0.001$ and $p = 0.005$. Besides education also affects the incidence of diarrhea by $p = 0.005$. Mother's knowledge has a significant relationship with their age, father's education, number of children, mother's occupation, and knowledge. Sources of knowledge of mothers obtained from various sources, namely information media, health services, doctors, families and reading. Irfan *et al.* (2016) shows the factors that influence diarrhea including breastfeeding (OR: 5,673 with $p = 0,000$), type of latrine (OR: 4,527 with $p = 0,000$) and the age of the child (OR: 1,460 with $p = 0.002$).

METHOD

The study was conducted using a case control approach. Populations in this study were toddlers in the Purwodadi I Health Centre, Grobogan Regency, as many as 4162 toddlers.

The independent variables in this study include latrine ownership, nutritional status, mother's hand washing skills, toddler hand washing skills, water sources, mother's knowledge level, mother's occupational status, mother's age, and history of breastfeeding, drinking water cooking habits, and the type of house floor. The dependent variable was of diarrhea in infants. The instruments in this study used questionnaires and observation sheets. Data collection techniques in this study were conducted by structured interviews using questionnaires, and observation sheets.

In this study, a multivariate analysis was performed to see the most influential factor among other factors in the independent and dependent variables using the Multiple Logistic Regression test.

RESULT AND DISCUSSION

Univariate Analysis

Table 1. Frequency Distribution of Factors Affecting Diarrhea

Variable	Category	Frequency	Percentage
Nutritional Status	Less	4	4.3
	Good	88	95.7
Breastfeeding	No	41	44.6
	Exclusive	51	55.4
	Occupation		
Occupation	No	41	44.6
	Yes	51	55.4
	Adolescent	26	28.3
Mother's age	Adult	66	71.7
	Elementary	27	29.3
	Mother's education		
Mother's education	Secondary and High School	65	70.7
	Raw	1	1.1
	Boiled	91	98.9
Water type	Occupied	60	65.2
	Unoccupied	32	32.8
	Occupied	14	15.2
Type of house floor	Occupied	78	84.8
	Unoccupied		
	Occupied	49	53.3
Latrine	Unoccupied	43	46.7
	Occupied	44	47.8
	Unoccupied	48	52.2
Mother's hand washing habit	Occupied	0	0.0
	Unoccupied	92	100
	Water source		
Toddler's hand washing habit	Less	49	53.3
	Good	43	46.7

Diarrhea	Less	46	50.0
	Good	46	50.0

The results of observations note that all the independent variables mostly meet health requirements, but still found several variables including floor type, mother's hand washing skills and knowledge of mothers whose categories are not good is greater.

Bivariate Analysis

Table 2. Bivariate Analysis

N	Independent Variable	Dependent Variable	<i>p</i> value	Description
1.	Nutritional Status		0.117	Not Related
2.	Breastfeeding		0.675	Not Related
3.	Occupation		0.093	Not Related
4.	Mother's age	Diarrhea	0.000	Related
5.	Mother's education		0.000	Related
6.	Water type		1.000	Not Related
7.	Type of house floor		0.004	Related
8.	Latrine		0.384	Not Related
9.	Mother's hand washing habit		0.000	Related
10.	Toddler's hand washing habit		0.000	Related
11.	Water source			Not Related
12.	Knowledge		0.000	Related

The results found that there was no relationship between nutritional status and the incidence of diarrhea with *p* value of 0.117 (*p*

value > 0.05). The raw nutritional status calculation shows a tendency that underfiveyearsbaby with underweight nutritional status are found having diarrhea, however, the number of toddlers with underweight nutritional status is 4 children compared to 42 other children who have diarrhea, therefore the incidence of diarrhea of toddlers who are in case group is not only because of the nutritional status. It is statistically found there is no meaningful relationship, but can be caused by other factors.

The results of this study found that nutritional status is not related to the incidence of diarrhea, because the determination of nutritional status is only based on two categories namely no lack of nutritional status and lack of nutritional status, for other nutritional status is not defined. The results of this study are in line with Albonehet *et al.*, (2013) study which found that nutritional status was not related to the incidence of diarrhea in infants. The results of other similar studies were also found in the research of Wibisino, Putra and Anggrainiet *et al.*, (2013) that descriptively found no apparent effect of nutritional status on the incidence of diarrhea.

The results found that there was no relationship between the history of breast milk with the incidence of diarrhea, with a *p* value of 0.675 (*p* value > 0.05). Based on the comparison between the incidence of diarrhea in infants given exclusive breastfeeding and not given exclusive breastfeeding is almost balanced, so that statistically found there is no relationship between exclusive breastfeeding with non-exclusive breastfeeding, however there is a tendency that infants who get exclusive breastfeeding did not have diarrhea and infants who did not get exclusive breastfeeding more experienced diarrhea.

Nurfita research (2017) found that there was a significant relationship between the history of exclusive and non-exclusive breastfeeding with the occurrence of diarrhea. Breastmilk has immunologic preventive properties in the presence of antibodies and other substances they contain. It also provides

protection against diarrhea. In newborns, direct breastfeeding has greater protection against diarrhea than indirect ones such as using bottle. Intestinal flora in breastfed babies prevents the growth of bacteria that cause diarrhea.

The results found that there was no relationship between maternal work and the incidence of diarrhea with p value 0,093 (p value > 0.05). The results of this study is different from studies conducted by Ariesta(2017) who found that maternal work was significantly related to the incidence of diarrhea in their toddlers.

The results found that there was a relationship between maternal age and the incidence of diarrhea with p value 0,000 (p value <0.05). The age of respondents who have entered adulthood will affect their more systematic frame of thinking, so that this level of maturity will influence their behavior including in parenting to children, so that the more mature the mother's age, the more experienced and more systematic in caring for and providing food intake and maintaining children's health. Therefore the statistical test results found that there is a significant relationship between the two variables. The results found that there was a relationship between maternal education and the incidence of diarrhea.

Mother's education influences the incidence of diarrhea in infants. Higher education will affect the perspective of mothers in child care including in the prevention of diarrhea. The results of this study are in line with research conducted by Hartati and Nurazila (2018) which found that there was a relationship between maternal education and the incidence of diarrhea. This type of research was the same as researcher's do, namely observational analytics. The results of this study found that education was related to the incidence of diarrhea in infants. Data analysis in the study used chi square only while in the analysis used by researchers was chi square and logistic regression.

The results found that there was no relationship between water habits with the

incidence of diarrhea with p value 1,000 (p value > 0.05). The consumption of boiled drinking water did not provide related results because the study respondents all used boiled drinking water, so statistically did not show results related to the incidence of diarrhea.

The results found that there was a relationship between the type of floor with the incidence of diarrhea with p value 0.004 (p value <0.05). Floor type is a factor in the incidence of diarrhea in infants. Healthy home floor is not dusty in the dry season and not wet in the rainy season. Wet and dusty floors can cause disease. A good floor is a floor that is dry and not moist. The floor material must be waterproof and easy to clean, at least it needs to be plastered and it would be better if it was coated with tiles or ceramic that is easy to clean (Health Ministry of Indonesia, 2002).

The results found that there was no relationship between latrine ownership and the incidence of diarrhea with a p value of 0.384 (p value > 0.05). The requirements for a healthy home are the availability of clean and proper latrines and the availability of clean water at home, so that it cannot contaminate drinking water sources that can cause diarrhea.

The results found that there was a relationship between the skill of washing hands with diarrhea with a value of 0,000 (p value <0.05). Habits associated with personal hygiene are important in preventing diarrhea, such as washing hands. Washing hands uses soap especially after defecating and before preparing food has an impact on diarrhea (Mafazah, 2013).

The results found that there was a relationship between hand washing in infants and the incidence of diarrhea with a p value of 0,000 (p value <0.05). Research conducted by Darmawan et al. (2008) found that hygiene sanitation behavior was a factor influencing the incidence of diarrhea. The difference between Darmawan research (2008) and this research was the research method, his study used descriptive method while in this research used analytic method.

The results found that the sources of water used both in the diarrhea group and non diarrhea group met the requirements. Chi square test was not defined so it was stated there was no relationship between water sources and the incidence of diarrhea.

The results found that there is a relationship between maternal knowledge and the incidence of diarrhea with p value 0,000 (p value <0.05). Knowledge is one form of the factors of predisposition of behavior, meaning that if someone has good knowledge there will be a tendency for good behavior. Finally, it can influence the consequences of the behavior in this study which is the incidence of diarrhea.

Research conducted by Ali (2010) examined the relationship of maternal knowledge about diarrhea to the occurrence of diarrhea in baby under five in Sewulan Village, Dagang District, Madiun Regency, found that knowledge is related to the incidence of diarrhea in toddlers, while in this study knowledge was accompanied by other variables in multivariate analysis.

Multivariate Analysis

Multivariate analysis used Logistic Regression test which goes through several stages. In Table 3 the results of the Logistic Regression analysis result are variables that affect the incidence of diarrhea, such as age of the mother, mother's hand washing skills, toddler's hand washing skills and mother's knowledge

Table 3. Logistic Regression Test

	Sig.	Exp(B)
Step 1		
Mother's age(1)	.035	19.527
Mother's education(1)	.371	3.934
Type of house floor(1)	.902	1.165
Mother's hand washing skill(1)	.009	53.306
Toddler's hand washing skill(1)	.031	21.049

Knowledge (1)	.001	450.652
Step 2		
Mother's age(1)	.025	20.576
Mother's education(1)	.347	4.112
Mother's hand washing skill(1)	.006	56.495
Toddler's hand washing skill 1)	.029	21.429
Knowledge (1)	.000	468.722
Step 3		
Mother's age(1)	.014	27.053
Mother's hand washing skill (1)	.003	67.892
Toddler's hand washing skill 1)	.019	27.879
Knowledge (1)	.000	547.240

The results of the factors analysis of predictors of diarrhea in infants at Purwodadi I District Health Center Grobogan Regency can increase knowledge in mothers especially those who have children under five years and can anticipate in preventing the occurrence of diarrhea on toddlers. This research was generally aimed to provide an overview of diarrhea problem as well as prevention efforts for children under five years old at Purwodadi I District Health Center Grobogan Regency.

There are many factors that can be done to prevent the occurrence of diarrhea in baby under five years. These factors include direct factors that consists of sanitary hygiene behavior and environmental conditions as well as indirect factors such as knowledge, education, age, income and forth (Pudjadi, 2001).

The implementation of a healthy clean life is a major factor because basically the incidence of diarrhea is inseparable from the clean and healthy life that is applied in a family. The application of a healthy lifestyle can prevent the emergence of various bacteria and viruses that cause disease including diarrheal disease (Ngastiyah, 2012).

The results of this study found that the relationship of factors affecting the incidence of diarrhea in infants, they are not only maternal age, mother's education, floor type, maternal personal hygiene, toddler's hand washing skills, but also mother's knowledge were significantly related to the incidence of diarrhea. Based on the results of multivariate analysis using logistic regression also found that the dominant variables affecting the incidence of diarrhea were mother's age, mother's hand washing skills, toddler's hand washing skills and mother's knowledge, as seen in the table above, the four independent variables were predictors of the incidence of diarrhea. in toddlers.

CONCLUSION

The conclusion in this study finds that the variables related to the incidence of diarrhea in infants are mother's age, mother's education, floor type, mother's hand washing skills, toddler's hand washing skills and mother's knowledge. The dominant variables affecting the incidence of diarrhea are mother's age, personal hygiene, toddler's hand washing skills and mother's knowledge

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