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The Relationship between Clean and Healthy Living Behavior and Risk of Diarrhea in Toddler

Naufal Rafi' Febriawan[1)], Uswatun Khasanah[2)], Ade Yusuf[2)]

[1)]Student at the Faculty of Medicine, Gunung Jati Swadaya University
[2)]Department of Public Health Sciences, Faculty of Medicine, Gunung Jati Swadaya University

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ABSTRACT

Background: Diarrhea is a process of defecation in which the stool is more liquid which can be accompanied by blood or mucus with the intensity of defecation increasing more than 3 times a day. The occurrence of diarrhea in children is often attributed to inadequate environmental hygiene. This study aimed to examined the relationship between clean and healthy behavior (PHBS) and diarrhea among toddlers in the working area of the Kalijaga Permai Cirebon Community Health Center.
Subjects and Method: This was a cross-sectional study conducted at the Kalijaga Permai Cirebon Community Health Center from May to June 2023. A total of 119 mothers with toddlers (aged 0-59 months) was selected for this study. The dependent variable was diarrhea. The independent variable was clean and healthy behavior (PHBS). The data were collected using a questionnaire and analyzed using chi square.
Results: Mothers with poor PHBS increased the risk of diarrhea in children by 4.69 times compared to good PHBS (OR= 4.69; 95% CI = 3.04 to 7.24; p<0.001).
Conclusion: Implementation of household clean and healthy behavior lower the risk of diarrhea.

Keywords: clean and healthy living behavior, diarrhea, toddlers.

Correspondence:
Naufal Rafi' Febriawan. Faculty of Medicine, Universitas Gunung Jati Swadaya. Jl. Pemuda No. 32, Cirebon 45132, West Java, Indonesia. Email: naufalrafi357@gmail.com. Mobile: +6285157825911.

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BACKGROUND

Diarrhea is a process of defecation in which the stool is more liquid which can be accompanied by blood or mucus and the intensity of defecation increases more than 3 times a day. The presence of bacterial, viral and parasitic infections causes diarrhea, especially rotavirus and Escherichia Coli bacteria. The digestive system has normal flora such as Escherichia Coli bacteria, but some of them are pathogenic and can cause diarrhea (Freya et al. 2022).

The highest period prevalence rate for diarrhea was in the age group < 1 year with an incidence rate of 7%, a prevalence period of 11.2% and the age group 1-4 years with an incidence of 6.7%, a prevalence period of 12.2%. It is recorded that 80% of deaths of children under 1 year old are recorded and the risk decreases with increasing age. According to WHO in 2017, almost 1.7 billion cases of diarrhea occurred in children

with a death rate of around 525,000 in children under five each year. Data reported to the Directorate of Family Health in 2020, of 28,158 under-five deaths, 72.0% (20,266) of them occurred during the neonatal period, 19.1% (5,386 deaths) occurred at the age of 29 days – 11 months and 9.9% (2,506 deaths) occurred at ages 12–59 months. In the group of children under five, the most common cause of death is diarrhea (Republic of Indonesia 2021).

Based on data from the Indonesian Ministry of Health in 2019, in 2018 the number of toddler diarrhea sufferers in Indonesia who were served in health facilities was 1,637,708 or 40.90% of the estimated diarrhea in health facilities. Based on the health profile of West Java province in 2021, the coverage of under-five diarrhea sufferers served in 2021 was 82.40% or the diarrhea morbidity rate per 1,000 population reached 843 cases, including Cirebon City which had the highest service coverage rate for diarrhea sufferers in West Java for under-fives. amounted to 115.6% (West Java Provincial 2021).

According to Cirebon City health profile data in 2021, the number of diarrhea sufferers was 3,296 toddlers, with the number served by health facilities being 2,116 toddlers (Cirebon City 2021). Based on health profile data from the Kalijaga Permai Health Center, diarrhea in the Kalijaga Permai Health Center working area is included in the 10 most common types of disease based on services described. In 2017, there were 561 toddlers who had confirmed diarrhea with a total of 1,546 under-five patients, in 2018 there were 644 under-five patients who Diarrhea was confirmed from a total of 1,472 toddler patients, and in 2019 as many as 727 toddler patients experienced diarrhea from a total of 1,502 toddler patients. In 2021, the rate of discovery of diarrhea cases was not as high as in 2019 with the discovery of 56 cases in patients under five and increasing in 2022 to 66 cases (Kalijaga Permai 2022). This indicates that the prevalence rate of diarrhea cases among toddlers in the Kalijaga Health Center working area is still quite high, although there has been a decline.

Diarrhea often occurs in toddlers because at that age children's intestines are very sensitive, especially in the first and second years. Management of household needs that are not clean enough, such as the use of water and food sourced from contaminated water, is one of the causes that can increase the risk of contracting diarrhea (Heryanto et al. 2022). Another contributing factor causing diarrhea in toddlers is the mother's behavior. The factors underlying this are knowledge in maintaining food hygiene and processing food properly. Cutlery that is not washed thoroughly can become a germ of disease due to the remaining microorganisms remaining and will contaminate food. According to previous research, of 115 subjects who have the habit of keeping cutlery clean, there are 42.6% of subjects who have a bad habit of keeping cutlery clean through the habit of washing cutlery by storing cutlery that has been washed and stored in the open because it dries quickly. and easy to use at any time (Nawalia, Ningsih, and Tambunan 2022).

Diarrhea in toddlers can cause poor child growth and development and disrupt the child's quality of life. Diarrhea in toddlers can be prevented by assessing risk factors that can cause children to get diarrhea. Good hygiene habits at home can help reduce the incidence of diarrhea in toddlers, especially in mothers of toddlers. clean and healthy living behavior can be influenced by many factors, including knowledge, because attitudes that have started with knowledge definitely influence attitudes better than

attitudes that have not started with knowledge at all (Indriati, 2022). Clean and Healthy Living Behavior is one of the government's priority programs through Community Health Centers and is an out-of-the-way target in implementing health development, as stated in the 2010 Strategic Plan of the Ministry of Health. According to 2018 Basic Health Research Data (Riskesdas) regarding clean and healthy living behavior, the proportion of household members who behave correctly in washing their hands properly in Indonesia is 49.8% (Indonesian 2021). The proportion of good waste management in households in Indonesia is still low, namely 36.8%. In Kalijaga sub-district, the clean and healthy living behavior level of the community in the household percentage is 70.57%, which indicates that not 100% of the people of Kalijaga sub-district carry out and implement clean and healthy living behavior in the household (Kalijaga Permai 2022).

Research related to clean and healthy living behavior and diarrhea has been carried out with the result that out of 43 subjects, more than half of the subjects (62.8%) showed that the mother's clean and healthy living behavior was categorized as not good, while the incidence of diarrhea was known to be more than the majority (72.1%) subjects who experienced diarrhea in toddlers aged 2-59 months. Based on the results of statistical analysis using the chi square test, a p value of 0.026 was obtained with a significance level of 95% ($\alpha = 0.05$). It can be concluded that there is a relationship between maternal clean and healthy living behavior and the incidence of diarrhea in children under five at the Sungai Liuk Community Health Center, Sungai Full City in 2020 (Rosiska et al., 2021).

Based on the background above, researchers are interested in conducting research on household clean and healthy living behavior with the incidence of diarrhea in toddlers in the working area of the UPTD Kalijaga Permai Health Center.

SUBJECTS AND METHOD

1. Study Design

This research is a quantitative study with an analytical observational design using a cross sectional approach. Cross-sectional is a research approach in which all data resulting from research measurements or observations are taken within the same time period to assess whether there is a relationship between variables so that it is analytical. Apart from that, this research is observational research, which means research without providing intervention and only making observations. Study conducted at the Kalijaga Permai Cirebon Community Health Center from May to June 2023.

2. Population and Sample

The research population is mothers who have toddlers in Cirebon Regency with an affordable population, namely mothers of toddlers who live in the working area of the Kalijaga Permai Cirebon Community Health Center. In this study, mothers of toddlers who met the inclusion and exclusion criteria were taken as research samples using a sampling technique using the consecutive sampling method. Consent to participate in the research will be given and those who refuse to give consent will not be included in this research.

3. Study Variables

The independent variable in this study is household clean and healthy living behavior, while the dependent variable in this study is the prevalence of diarrhea in toddlers in the working area of the Kalijaga Permai Health Center, Cirebon.

4. Operational Definition of Variables

Clean and healthy living behavior in this study is a mother's daily habits that reflect clean and healthy living behavior based on

the mother's answers in the questionnaire and is included in an ordinal measuring scale and has measuring results, namely good, sufficient and poor. Meanwhile, the incidence of diarrhea in this study is a history of diarrhea incidents experienced by toddlers in the last 1 month with measurement results of diarrhea and no diarrhea and is included in the ordinal measuring scale.

5. Data Instrument

The instrument used to obtain primary data in this research was a questionnaire containing a list of questions. The questionnaire given to subjects aims to see the characteristics of the subjects such as age, education level and occupation. Apart from that, this questionnaire also looks at the level of clean and healthy living behavior in the household setting. Determining the score for the clean and healthy living behavior statement uses the Gutman scale with a measuring scale of good if the score is 76% - 100%, and poor if the score is ≤ 75%.

6. Data analysis

Data were analyzed using univariate analysis to describe the frequency distribution picture for each variable studiednamely knowing the description of the frequency distribution of PHBS behavior with the prevalence of diarrhea in toddlers in the working area of the Kalijaga Permai Cirebon Community Health Center. Meanwhile, bivariate analysis was used in this research to obtain an association or relationship between two independent and dependent variables using a statistical correlation test, namely the chi square test with a significant limit of $p < 0.05$.

7. Research Ethics

This research uses human research subjects so approval from the Ethics Commission of the Faculty of Medicine, Gunung Jati Cirebon Swadaya University is required. This research has received ethical approval from the FK UGJ Research Ethics Commission with No.56/EC/FKUGJ/V/2023. Next, the researcher submitted a research permit letter to several agencies such as the Cirebon City Health Service, the Cirebon City National and Political Unity Agency, and submitted the research requirements documents to the Kalijaga Permai Cirebon Community Health Center to obtain permission to collect research data.

Explanations to research subjects were carried out clearly in accordance with the principles of medical ethics. The first principle, namely respect for person, is defined as the volunteerism of subjects in participating in research and ensuring the confidentiality of subjects' personal data. Second, beneficence, namely that subjects know the objectives, benefits and procedures of the research. Third, justice, namely that subjects receive the same treatment. Next, subjects who are willing to sign a consent form to become subjects and fill out the questionnaire sheet.

RESULTS

1. Characteristic Sample

Based on Table 1 describes the characteristics of the research sample including mother's age, toddler's age, mother's education, and mother's work. In the classification of maternal age, in the age range of 26 - 35 years there were 68 samples (57.1%) being the majority of research samples. At the age of toddlers, the majority at the age of 0 - 12 months there were 36 samples (30.3%). At the mother's education level, the majority of samples had a basic education up to high school as many as 56 samples (47.1%). As for the type of work, most mothers of toddlers are housewives as many as 95 samples (79.8%).

2. Univariate Analysis

a. Frequency distribution of diarrhea prevalence in toddlers

Based on Table 2 showed that the highest prevalence of toddlers with diarrhea was 60

people (50.4%) and 59 people without diarrhea (49.6%).

b. Frequency distribution of clean and healthy living behavior

Based on Table 3 showed that the most clean and healthy living behavior in households was in the good category as many as 75 people (63%), adequate behavior as many as 42 people (35.3%) and poor behavior as many as 2 people (1.7%).

Table 1. Sample characteristic

Characteristics	Frequency (N)	Percentage (%)
Age Mom's (years)		
19 – 25	18	15.1
26 – 35	68	57.1
36 – 45	33	27.7
Age Toddler (month)		
0 – 12	36	30.3
13 – 24	23	19.3
25 – 36	28	23.5
37 – 48	20	16.8
49 – 60	12	10.1
Education		
Elementary school	13	10.9
Junior hig school	20	16.8
Senior high school	56	47.1
Scholar	15	12.6
Did not finish elementary school	3	2.5
Did not finish junior hig school	9	7.6
Did not finish senior high school	3	2.5
Job		
Housewives	95	79.8
Civil servants	4	3.4
Self employed	1	0.8
Labor	7	5.9
Business	4	3.4
Private sector employes	6	5.0
Farmers	1	0.8
Police	1	0.8

Table 2. Prevalence of diarrhea in toddlers

Diarrhea	Frequency (n)	Percentage (%)
No diarrhea	59	49.6
Diarrhea	60	50.4

Table 3. Frequency distribution of clean and healthy living behavior in the household

PHBS behavior	Frequency (n)	Percentage
Good	75	63.0
Enough	42	35.3
Not enough	2	1.7

c.Distribution of clean and healthy living behavior indicators with

diarrhea

Based on Table 4 shows that there are 5 indicators where the level of diarrhea due to non-application of clean and healthy living behavior indicators tends to be high or has weak indicators, such as indicators of exclusive breastfeeding, water sources, hand washing behavior, use of healthy latrines, and eradication of mosquito larvae.

Table 4 it can be seen that 100% of subjects in the clean and healthy living behavior category experienced moderate diarrhea. This can be caused by the low value of several clean and healthy living behavior indicators as follows:

Based on Table 4, it shows that there were 13 (19.69%) toddlers who were not given exclusive breast milk and had diarrhea, while 53 (80.3%) of the toddlers who were not given exclusive breast milk and experienced diarrhea were 53 (80.3%). There were 46 (86.7%) toddlers who received exclusive breastfeeding and had no diarrhea, while 7 children (13.2%) received exclusive breast milk and had diarrhea.

Furthermore, Table 4, it also shows that families of toddlers who do not have from mineral water company, wells > 10 m and no diarrhea are 21 subjects (28.76%), while families of toddlers who do not have mineral water company, wells > 10 and children who experience diarrhea are 52 (71.23%). There were 38 (82.60%) families of toddlers who had mineral water company, wells >10 and no diarrhea, while families of toddlers who had mineral water company, wells >10 and diarrhea were 54 children (48.2%).

The next indicators in Table 4 above show that families of toddlers who do not wash their hands and do not have diarrhea are 11 subjects (16.6%), families who do not wash their hands and children who experience diarrhea are 55 (83.3%). There were 48 (90.56%) families of toddlers who washed their hands and had no diarrhea, while there were 5 (9.43%) families of toddlers who washed their hands and had diarrhea.

Meanwhile, Table 4 above shows that 8 subjects (13.1%) of families of children under five did not have a healthy toilet and had no diarrhea, 53 (86.8%) families did not have a healthy toilet and children had diarrhea. There were 51 (87.93%) families of toddlers who had healthy toilets and no diarrhea, while there were 7 children (12.06%) of families of toddlers who had healthy toilets and had diarrhea.

The last indicator in Table 4 shows that families of children under five do not carry out clean and healthy living behavior on the mosquito larvae indicator as many as 31 families with the total incidence of diarrhea that didn't carry out clean and healthy living behavior was 28 (90.3%) and 3 (9.67%) did not experience diarrhea. Meanwhile, families of children under five who eradicated mosquito larvae and did not experience diarrhea were 56 (63.6%) of the total families who eradicated mosquito larvae.

Table 4. Distribution of clean and healthy living behavior Indicators with diarrhea

Clean and healthy living behavior indicators	Diarrhea Occurrence					
	No diarrhea		Diarrhea		Total	
	N	%	N	%	N	%
Exclusive breast milk						
Yes	46	86.79	7	13.2	53	100
No	13	19.69	53	80.3	66	100
Birth-Nakes						
Yes	59	49.57	60	50.4	119	100
No	0	0	0	0	0	0
Weighing toddlers at Posyandu						

Clean and healthy living behavior indicators	Diarrhea Occurrence					
	No diarrhea		Diarrhea		Total	
	N	%	N	%	N	%
Yes	58	51.78	54	48.21	112	100
No	1	14.28	6	85.71	7	100
Use of Water Sources						
Yes	38	82.6	8	17.39	46	100
No	21	28.76	52	71.23	73	100
Wash your hands						
Yes	48	90.56	5	9.43	53	100
No	11	16.6	55	83.3	66	100
Use of Healthy Latrines						
Yes	51	87.93	7	12.06	58	100
No	8	13.11	53	86.88	61	100
Eradicating mosquito larvae						
Yes	56	63.6	32	36.3	88	100
No	3	9.67	28	90.32	31	100
Consume Vegetables						
Yes	57	50.4	56	49.5	113	100
No	2	33.3	4	66.6	6	100
Do physical activity						
Yes	57	51.35	54	48.64	111	100
No	2	25	6	75	8	100
Smoking outside the house						
Yes	58	50.87	56	49.12	114	100
No	1	20	4	80	5	100

3. Bivariate Analysis

a. The relationship between household clean and healthy living behavior and the incidence of diarrhea in toddlers

Based on Table 5 shows that the chi square test results found a value of p=0.000 (p<0.05), meaning that there is a significant correlation between household clean and healthy living behavior and the incidence of diarrhea in toddlers. With an odds ratio value of 4.69(95% CI = 3.04 to 7.24). Which means that low clean and healthy living behavior habits are a risk factor 4.69 times for diarrhea compared to good clean and healthy living behavior habits. The direction of correlation in this study is positive, where the better the household's clean and healthy living behavior, the lower the incidence of diarrhea in toddlers aged more than 6 months.

Diarrhea is an environmental-based disease that can be prevented by keeping the environment clean. clean and healthy living behavior makes someone able to help themselves in the health sector and play an active role in realizing public health from the results of learning that is practiced based on self-awareness.

Implementing a family lifestyle by implementing clean and healthy living behavior as a measure of health status so that family members, especially mothers, can reduce the risk of diarrhea in toddlers, because toddlers are vulnerable to infection and are dependent on the environment and unable to care for themselves. The mother's behavior will determine the transmission of environmental-based diseases such as diarrhea by implementing clean and healthy living behavior as a prevention of disease infections that enter through ports of entry in the body and through clean and healthy living behavior it can also increase the

family's health level to avoid disease.

Table 5. Correlation between household clean and healthy living behavior and the incidence of diarrhea in toddlers

Clean and healthy living behavior	OR	95% CI		p
		Lower limit	Upper limit	
Poor Good	4.69	3.04	7.24	<0.001

DISCUSSION

Shows that the chi square test results found a value of p<0.001 (p<0.05), meaning that there is a significant correlation between household clean and healthy living behavior and the incidence of diarrhea toddlers in the Kalijaga Permai Cirebon Community Health Center work area. With an odds ratio value of 4.69 (95% CI= 3.04 to 7.24). Which means that low clean and healthy living behavior habits are a risk factor 4.69times for diarrhea compared to good clean and healthy living behavior habits. Which means that there is a significant correlation between clean and healthy living behavior and the incidence of diarrhea. In line with research conducted by Muhammad et al. (2023) stated that there is a relationship between waste processing and the incidence of diarrhea in toddlers due to unresponsive waste disposal and still does not meet cleanliness requirements, such as trash cans that are not covered so that they will attract disease vectors (flies, rats, cockroaches, etc.) and liquid waste that does not meet the requirements cannot be avoided without processing it in a holding tank but throwing it directly onto the ground.

Clean and Healthy Living Behavior is a health behavior that focuses on increasing knowledge so that family members can help themselves in the medical field and take part in community health efforts. Families are involved in the public health movement through clean and healthy living behavior because provides them with information, inspiration and knowledge about healthy lifestyles. Diarrhea is a disease that can be prevented by maintaining a clean environment. One disease whose spread is influenced by the environment is diarrhea. According to research, several risk factors for diarrhea in toddlers include the mother's education level, history of breastfeeding, hand washing habits, type of toilet at home, density of mosquito larvae and other clean and healthy living behavior indicators (Setyarini et al., 2022).

Through the Ministry of Health, Indonesia recommends maintaining the physical quality of water used within the family as one of the measures to prevent disease by using clean water through choosing the right water source, storing it in a clean and closed place, washing all cooking utensils and using sourced drinking water. in boiled or boiled water. The requirements for clean water that is suitable for consumption are odorless, tasteless and clear. Communities can reduce the risk of diarrhea by limiting contamination of the clean water sources they use and storing them properly at home. In the indicators for the use of wells as a water source used in this research, there are still many that do not comply with the requirements so that the use of wells as a source of clean water must pay attention to such as maintaining a minimum distance of 10 meters from drains, swamps and waste disposal to avoid contamination by water containing bacteria, especially E.coli (Alamsyah and Marianti 2020).

It is very important to pay attention to the transmission of diarrheal diseases using this method of transmission because infected food or liquids can enter the body through dirty hands. Although most people understand the need to wash their hands, sometimes they don't know when to do it properly. The condition of healthy latrines must meet the requirements so that they do not become a breeding ground for vectors that cause diarrheal disease, because latrines have a big impact on the environment and the risk of diarrheal disease (Asih and Saragih, 2019).

By implementing healthy latrines, we can avoid the potential for diarrhea in toddlers caused by contamination through vectors that move from one place to another, thereby allowing the proliferation of diarrheal disease vectors. This research is in line with research by Harapan (2022) which states that using a latrine is a risk factor for diarrheal disease, because feces that are not disposed of in the latrine will become a source of transmission where the germs in the feces can directly contaminate other people through contaminated food from other people's hands when handling or through insects. Therefore, careless disposal of feces or those that do not have health requirements such as open defecation free can create opportunities for pollution from the breeding of insects, flies, rats, and can even pollute the environment and clean water sources. Apart from this contamination, several bad habits of mothers who often put and throw away diapers containing children's feces, such as on the bathroom floor and do not clean them first before throwing away the diapers, can also pollute the environment in the house. Due to these reasons, proper disposal of feces must comply with health requirements and regulations.

Improper processing of waste or household waste is one form of trigger for high density of vectors that cause diarrhea such as flies, mice, cockroaches, mosquitoes and others. The indicators for processing household waste must also pay attention to the basic clean and healthy living behavior aspects in eradicating mosquito larvae in the household environment. This indicator is a weak indicator. In research with the distribution of household clean and healthy living behavior, it was found that the number of families who did not eradicate mosquito larvae was still relatively large. The correlation with this indicator is because diarrheal disease vectors that land in waste or household rubbish without being managed properly can transfer pathogens or microorganisms, thereby increasing vector density which can increase the risk factor for the transmission of diarrhea (Eldysta et al. 2022).

Processing household waste and eradicating mosquito larvae is an integral part that cannot be separated from the distribution of vectors, both flies and mosquitoes are examples of mechanical vectors that function as passive means of transfer by contaminating the transmission medium. Poor waste processing and storage conditions will support the spread of viruses or bacteria that cause diarrhea in children under five. In accordance with several previous studies, it states that the incidence of diarrhea can be caused by several factors such as low implementation of household clean and healthy living behavior, breastfeeding for less than 6 months or not according to recommendations causing children's immunity to decrease, inappropriate use of water and toilets, processing household waste. improper stairs, and not doing CTPS (washing hands with soap). Therefore, people are obliged to behave in a clean and healthy living behavior in order to reduce the incidence of diarrhea and prevent the

incidence of diarrhea in the family, especially in toddlers (Jannah et al., 2019).

AUTHOR CONTRIBUTION

Naufal Rafi' Febriawan is the main researcher who chose the research topic, collected data, analyzed and reported, reviewed and analyzed the results and manuscript as a whole, compiled the literature review. determining study implementation, data collection, tool development, analysis and interpretation of results.

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CONFLICT OF INTEREST

There is no conflict of interest.

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