RELATIONSHIP ANALYSIS BETWEEN KNOWLEDGE, FACILITIES AND BEHAVIOR OF HOUSEHOLD WASTE MANAGEMENT AND INCIDENCE OF TODDLERS' DIARRHEA IN SEDAH KIDUL VILLAGE

Wardatul Raihan[1*], Trias Mahmudiono[2]
[1]Department of Biostatistics and Population
[2]Department of Health Nutrition
Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia
Address Correspondence: Wardatul Raihan
Email : wardatul.raihan-2017@fkm.unair.ac.id

ABSTRACT

Introduction: Determinants of health consist of social and physical determinants; one the factors included in physical determinants is environment. Environmental conditions that aren't healthy can attract flies to land. Diarrhea is caused by vectors (flies) that contaminate food and drink consumed by humans. This research aimed to analyze the strength of the relationship between knowledge, facilities, and behavior of household waste management with the incidence of diarrhea in toddlers in Sedah Kidul Village. **Methods:** This research was a descriptive study with a quantitative approach and a cross-sectional study design. Respondents were selected using simple random sampling from families with toddlers in Sedah Kidul Village as many as 40 respondents. The questionnaire was distributed to respondents to obtain research data. The statistical test used was the contingency coefficient to analyze the strength of the relationship between the variables tested. **Result:** The results showed the strength of the relationship for level of knowledge (p-value = 0.373 and C = 0.269) including the weak category, availability of facilities (p-value = 0.380 and C = 0.267) including the weak category, and household waste management behavior (p-value = 0.763 and C = 0.168) including the very weak category with the incidence of toddler diarrhea. **Conclusion:** The conclusion based on the results of statistical tests is there was no significant relationship between knowledge, facilities, and behavior of household waste management with the incidence of toddler diarrhea, supported by the strength category of the relationship on the three variables.

Keywords: Knowledge, facilities, behavior, waste management, diarrhea

INTRODUCTION

Determinants of health were divided into two categories (social and physical determinants), environmental factor was one of the factors included in the category of physical determinants of health, environmental conditions also one of the physical determinants of health and one of the factors in point five (neighborhood and built environment) in five (5) key areas of Social Determinants Of Health (SDOH) which could affect the risk of human health, health or illness, improved function and quality of life (Healthy People, 2020). Environmental factor was in first rank and the highest factors that affects and determines the degree of public health (Bureau of Communication and Community Services Ministry of Health Republic of Indonesia, 2019).

Environment were home/residence, educational institutions, government agencies, health institutions and other public places and a place for activities those shared in everyday life (Healthy People, 2020). Activities and habits carried out by humans in their daily lives would be determined by how good or bad their health status was, from the individual level to the group level (Ridlo et al., 2019). In addition to activities, humans have an immune system that determines the condition of their health status (healthy/sick); human immunity could keep them from getting sick and, therefore, it must be maintained in various ways (the intake into the body, clean and healthy living habits and related conditions environment) (Wahana and Rochmania, 2019). The clean and maintained environment could prevent various kinds of diseases, not only related to waste problems but also related to chemistry,

 License doi: 10.20473/ijph.vl17il.2022.305-318 Received 29 September 2020, received in revised form 24 November 2020, Accepted 30 November 2020, Published online: August 2022

biology and socio-culture, also determines how environmental conditions will be created (Bureau of Communication and Community Services Ministry of Health Republic of Indonesia, 2019).

Environmental conditions that aren't clean and healthy can cause various types of diseases; diarrhea is one of the diseases that indirectly caused by the environment. Diarrhea Is one of the most contagious diseases experienced by the population of Indonesia and could spread at various ages (Ministry of Health of the Republic Indonesia, 2011). The prevalence of diarrhea in Indonesia (every year) could be estimated to have increased, based on data from Riset Kesehatan Dasar (Riskesdas) in 2018 which showed the prevalence of diarrhea in Indonesia (based on diagnosis by health workers) in 2013 (4.5%) increased by 2.3% to 6.8% in 2018. The prevalence had increased for incidence of diarrhea among children under five (based on the diagnosis of health workers), where the prevalence in 2013 was 2.4%increasing by 8.6% to 11.0% in 2018 (Research and Development Agency for Health Ministry of Health of the Republic Indonesia, 2018).

Diarrhea could cause another serious condition and even death, and would get worse if it occurs in toddlers (Ministry of Health of the Republic Indonesia, 2011). Another impact of the diarrhea in toddlers was if the toddler wasn't only experiencing diarrhea once or twice, it would result in disruption of growth because diarrhea causes abnormalities in the toddler's digestive tract system (absorption disorders so the necessary nutritional intake isn't fulfilled properly) (Suherman and Aini, 2019). Diarrhea is caused by organisms such as bacteria, viruses and parasites that contaminate food and drinks, then infect the digestive tract (Ministry of Health of the Republic Indonesia, 2011). The incidence of diarrhea can be caused by other risk factors.

The research entitled "Determinants of diarrhea among children under two years old in Indonesia" explained determinant factors have a significant relationship and were essential factors in the occurrence of diarrhea in children under two years of age in Indonesia, namely maternal age, maternal education, type toilet facilities, non-exclusive breastfeeding and bottle feeding (Santika et al., 2020).

Another study entitled "Association between women's empowerment and diarrhea in children under two years in Indonesia" suggested that women's empowerment was necessary for reducing child morbidity and mortality (especially the incidence of diarrhea), besides that the level of knowledge possessed by women (mothers) was proven to have a significant relationship with the incidence of diarrhea in children (Astutik et al., 2020). Based on other research, it was explained that the risk factors for the occurrence of diarrhea in children under five years of age were the level of mother's knowledge, history of breastfeeding, mother's habits in washing hands, type of family toilet, and density of flies (Wijaya, 2012). Other studies that were parallel, showed a relationship between fly density and the incidence of diarrhea (Nurfita, 2017).

The presence of flies is often associated with environmental conditions; clean and healthy environmental conditions can reduce the possibility of flies around the house. It is feared that flies that breed and live around the house can cause health problems (such as diarrhea). Therefore, the problem of garbage piles must be addressed. Waste is one of the factors that influence environmental conditions; the increased volume of waste that is not accompanied by additional facilities and processes to manage waste will cause piles of garbage which can cause problems that affect the quality of the environment. The problem is it will become a hotbed of disease and cause an unpleasant smell. Piled-up garbage will attract the attention of disease-carrying vectors (flies and mice) to live and breed, due to the unpleasant smell that comes out of the garbage pile. Garbage must be handled and managed properly, including sorted, collected to Temporary Shelters (TPS), and

transportation from TPS to Final Processing Sites (TPA) (Bellona and Lagiono, 2015).

Unsuitable household waste management could cause the home environment to become dirty, this would attract flies around the house and allow them to contaminate food (Suherman and Aini, 2019). If waste management is considered trivial and not properly cared for, it could indirectly lead to life-threatening diseases (especially if the disease attacks toddlers whose immune systems aren't as good as adults), one of these diseases is diarrhea (Nurfita, 2017).

Maintaining the environment to be kept clean, healthy and without piles of waste must be accompanied by how someone performs waste management, starting with how someone knows waste management (this is very important) because knowledge about this would underlie someone to act/take action and could contribute positively according to the objectives of waste management (Gusti et al., 2015).

Previous research explained that knowledge has a relationship with a person's behavior in managing waste, where someone who has low level of knowledge has a 0.367 times greater risk of behavior (managing waste) that isn't good and, vice versa, if someone has high level of knowledge then he would do good waste management behavior (Saputra, Sangga N.S., and Mulasari, S.A, 2017). Changes in individual and group behavior toward behaviors that support the creation of the highest degree of health could affect environmental conditions, where positive changes would increase the degree of health that could be maintained for a long time, and, if this continues, it could create a healthier society in the future (Healthy People, 2020).

Based on the description of the background, to find out how is the strength of the relationship between the variables of the respondents' level of knowledge, the availability of facilities, and the behavior of respondents regarding household waste management with the variable incidence of diarrhea in toddlers, especially in Sedah Kidul Village, Purwosari District, Bojonegoro Regency, it is necessary to conduct research that can analyze the strength of the relationship between these variables.

METHODS

The design of this research is a cross-sectional study. This research is descriptive with a quantitative approach. The research location is in Sedah Kidul Village, Purwosari District, Bojonegoro Regency. The time of research was from December 2019 to January 2020. The study population is all families with toddlers in Sedah Kidul Village, Purwosari District, Bojonegoro Regency, totaling 60 families. A simple random sampling technique is used to draw samples and calculate the sample size, to obtain the calculation results that are 40 respondents to become the research sample. The independent variables of this research are knowledge, facilities, and behavior of household waste management and the dependent variable is the incidence of diarrhea in toddlers in Sedah Kidul Village.

This study uses primary data collected from the results of filling in a structured questionnaire given to respondents to measure the variables of the respondent's level of knowledge, the availability of facilities, and the respondent's behavior in managing household waste. The questionnaire contains questions that represent in measuring the level of the respondent's knowledge, availability of facilities, and respondent behavior in carrying out household waste management and the incidence of diarrhea in toddlers in the last two weeks (until data collection is carried out).

Correct answers have a score of 1 and wrong answers have a score of 0 on each question, then the scores are added and divided by the total questions so that the final score will be obtained. The final value (on the variable level of knowledge, availability of facilities, and behavior of

household waste management) is then categorized into four levels, very poor (0 - 24.9), poor (25 - 49.9), good (50 - 74, 9), and very good (75-100).

Data are analyzed by statistical contingency coefficient test to determine the strength of the relationship between the dependent variable and the independent variables. Criterion for analyzing the strength of the relationship was looking at the value of C. The classification of relationship strength is divided into very weak (0.00 - 0.25), weak (0.26 - 0.50), moderate (0.51 - 0.75), and strong (0.76 - 1).

This study has received approval from the Health Research Ethics Commission of the Faculty of Nursing, Airlangga University with the ethical review certificate number : 1769 – KEPK.

RESULTS

This section will explain the characteristics of respondents, the respondents' level of knowledge about household waste management, the availability of household waste management facilities, household waste management behavior, and the incidence of diarrhea in toddlers in Sedah Kidul Village, as well as the results of cross-tabulation and statistical analysis to determine the significance and level of relationship strength between the level of knowledge about household waste management, the availability of facilities and behavior of household waste management with the incidence of diarrhea in toddlers, especially in Sedah Kidul Village, Purwosari District, Bojonegoro Regency.

Respondents' Characteristics

Table 1 shows that most of the respondents were female (38 people; 95%), and aged 30 years and over (23 people; 57.5%), 40% of whom had primary school education (16 people), as well as jobs as housewives (IRT) at 75% (30 people).

Table 1. Distribution of Respondents' Characteristics

Variable	Category	Number (persons)	Percentage (%)
Gender	Male	2	5
	Female	38	95
Age	Under 30 years	17	42.5
	30 years and over	23	57.5
Education	SD	16	40
	SMP	12	30
	SMA	11	27.5
	Other	1	2.5
Profession	Housewife (IRT)	30	75
	Private	2	5
	Traders	1	2.5
	Farmers	7	17.5

Table 2 shows the distribution of level of knowledge, availability of facilities, the behavior of household waste management, and incidence of diarrhea in toddlers in Sedah Kidul Village. From that table, could saw the variable category with most respondents. First, for the variable level of knowledge about household waste management, most respondents were at a very good level of knowledge (20 people; 50%). Variable availability of household waste management facilities found most respondents were in the category of availability of very good facilities (26 people; 65%). In the third variable of household waste management behavior,

most respondents were in the good behavior category (17 people; 42.5%). The last variable was the incidence of diarrhea in toddlers; the category with the most respondents was the category that doesn't have the incidence of diarrhea in toddlers (35 people; 87.5%).

Table 2. Distribution Level of Knowledge, Availability of Facilities, Behavior of Household Waste Management, and the Incidence of Diarrhea in Toddlers

Variable	Category	Number (persons)	Percentage (%)
Level of Knowledge	Very Poor	1	2.5
	Poor	6	15
	Good	13	32.5
	Very Good	20	50
Availability of Facilities	Very Poor	1	2.5
	Poor	4	10
	Good	9	22.5
	Very Good	26	65
Behavior	Very Poor	9	22.5
	Poor	5	12.5
	Good	17	42.5
	Very Good	9	22.5
Diarrhea in Toddlers	Yes	5	12.5
	No	35	87.5

Relationship between Level of Knowledge, Availability of Facilities, and Behavior of Household Waste Management with the Incidence of Diarrhea in Toddlers

The results of cross-tabulation and statistical test analysis of the contingency coefficient between the independent variables (the level of knowledge, availability of facilities, and behavior of household waste management) with the dependent variable (the incidence of diarrhea in toddlers) are shown in Table 3. From this table, it can be seen that respondents who have a very good level of knowledge and don't have diarrhea (16 people; 40%) were the highest among the others. The p-value generated from the test for the variable level of knowledge and the incidence of diarrhea in toddlers was 0.373 and the resulting C value (contingency coefficient) = 0.269. From analysis for the second variable between the availability of household waste management facilities and the incidence of diarrhea in toddlers it is known that the highest number of respondents was in the category of very good facilities and doesn't have diarrhea (21 people; 52.5%), the p-value obtained from the results statistical test was 0.380 and the value of C = 0.267. Cross-tabulation and statistical tests for the variable household waste management behavior with the incidence of diarrhea in toddlers showed that most respondents were in the good behavior variable category and didn't have diarrhea (14 people; 35%), and resulted in a p-value = 0.763 and a C value (contingency coefficient) = 0.168.

Table 3. Cross Tabulation and Analysis of the Relationship Between Level of Knowledge, Availability of Facilities, and Behavior of Household Waste Management and the Incidence of Diarrhea in Toddlers

Variable	Category	Incidence of Diarrhea in Toddlers				Total		*p-value*	*C*
		Diarrhea (n)	%	No Diarrhea (n)	%	Amount (n)	%		
Level of Knowledge	Very Poor	0	0	1	2,5	1	2.5	0.373	0.269
	Poor	1	2.5	5	12.5	6	15		
	Good	0	0	13	32.5	13	32.5		
	Very Good	4	10	16	40	20	50		
Availability of Facilities	Very Poor	0	0	1	2.5	1	2.5	0.380	0.267
	Poor	0	0	4	10	4	10		
	Good	0	0	9	22.5	9	22.5		
	Very Good	5	12.5	21	52.5	26	65		
Behavior	Very Poor	1	2.5	8	20	9	22.5	0.763	0.168
	Poor	0	0	5	12.5	5	12.5		
	Good	3	7.5	14	35	17	42.5		
	Very Good	1	2.5	8	20	9	22.5		
Total		**5**	**12,5**	**35**	**87,5**	**40**	**100**		

The conclusion could be drawn based on the results of statistical tests between the independent variable (respondents' level of knowledge, availability of facilities, and household waste management behavior) and the dependent variable (the incidence of diarrhea in toddlers), that there was no significant relationship (presented in Table 3). The absence of a significant relationship between the tested variables was supported by the resulting C value or the contingency coefficient, which for all three independent variables showed the strength of the relationship was in the weak and very weak categories. The level of knowledge about household waste management (C = 0.269) was in the weak category, the availability of household waste management facilities (C = 0.267) was in the weak category, and household waste management behavior (C = 0.168) was in the very weak category regarding the strength of the relationship with the incidence of diarrhea in toddlers in Sedah Kidul Village.

DISCUSSION

A source explained that the improvement of water, sanitation and hygiene (WASH) could reduce the possibility of diarrhea disease; therefore, each component in the WASH intervention needs to be coordinated (not separating one component from another) to run more effectively because the intervention component acts based on their respective interrelated transmission lines. The study

also explained the results of evaluating the influence of intervention (hygiene promotion) on knowledge and it was stated that an increase in knowledge wasn't related to how one's hygiene practices/actions would be better (Mills and Cumming, 2016). Knowledge about health and related matters was something important because it could indirectly affect the degree of health because, based on the knowledge a person had, it would determine the implementation (actions/behavior) of a person's healthy lifestyle either at home or outside the home (Sukmawati, Hasyim and Yanzi, 2016). Good knowledge about public health will support a person in having healthy behavior and in carrying out environmental health activities, which are examples of efforts to prevent diarrhea in toddlers. Environmental sanitation efforts with proper waste management need to be done because garbage is a breeding ground for various vectors (flies, mosquitoes, mice, cockroaches, etc.) which are the cause of various types of diseases, besides that garbage could indirectly contaminate water, land and even food for consumption so that it must be managed properly (Ministry of Health of the Republic Indonesia, 2011). Piles of garbage ere around / close to where the community lives make the community more at risk for adverse and detrimental health effects (having diarrhea, congestion, dry cough, eye irritation, and asthma) compared to people who live far from the pile of rubbish, caused by multiplying disease-causing vectors (Munyai and Nunu, 2020). The long-term solution to solve the waste problem is to manage waste properly, for example with the 3R principle (reduce, reuse and recycle) (Government Regulation of the Republic of Indonesia Number 81 of 2012 concerning Management of Household Waste and Waste of Similar Types of Household Waste). People need to have good knowledge about waste management with the 3R principle so that then they can apply proper waste management and prevent health problems, especially diarrhea. Supporting research states that the risk factors for diarrhea in toddlers are caregiver's education (caregiver for this case could be interpreted as parents who care for their children) and education about environmental health was preferred. Improved caregivers' education and conducting health promotion on hygienic behavior at the household level, especially in poor environments were linked to reducing the incidence of under-five diarrhea in Kenya (Mulatya and Ochieng, 2020).

In addition to the knowledge that was a risk of diarrhea in toddlers, other factors have a significant influence on how someone had the intention and behavior in terms of managing waste by recycling, was the situational factor (Latif et al., 2012). The situational factor relates to the availability of facilities to manage waste; the provision of waste management facilities was directly proportional to community participation in waste management (the fewer facilities were available, the lower the community would participate in managing waste). High participation of the community in managing waste properly would have a positive impact; the problem of waste and the effect could be reduced or even eliminated, including its health impacts. There is a research which explains that less supportive waste management facilities could influence d a person's intention and behavior in carrying out waste management (Latif et al., 2012).

The Centers for Disease Control and Prevention (CDC) stated that one of the things that could done to save human lives from the consequences of diarrhea is to provide adequate sanitation and adequate waste disposal, so it could be concluded that the provision of sanitation facilities is a step/effort in reducing the risk of diarrhea (Centers for Disease Control and Prevention (CDC), 2015). The Centers for Disease Control and Prevention (CDC) also stated that one thing that could done as an effective intervention for diarrhea problems was to support health promotion programs and behavior change so these were clearer and on target; these support the assumption that

one's behavior could directly affect the incidence of diarrheal disease (Centers for Disease Control and Prevention, 2013).

According to the Government Regulation of the Republic of Indonesia Number 81 of 2012 (concerning Management of Household Waste and Waste of Similar Types of Household Waste) waste management means carrying out activities systematically and thoroughly to reduce and deal with waste problems; the principle that could be implemented in waste management is the 3R (reduce, reuse and recycle) with one of the objectives of waste management, namely to preserve the environment and public health (Government Regulation of the Republic of Indonesia Number 81 of 2012 concerning Management of Household Waste and Waste of Similar Types of Household Waste). Environmental damage can minimize and the quality of the environment can improve for the better by increasing the participation of the community in managing waste properly, so it can prevent public health problems and indirectly improve the quality of life for the better for the next generation of the nation. Waste management is carried out by reducing, namely limited piles, recycling, and reuse and by handling waste, whereby the role of the community in managing waste is very important, especially for managed waste at the household level (Government Regulation of the Republic of Indonesia Number 81 of 2012 concerning Management of Household Waste and Waste of Similar Types of Household Waste). Community behavior in managing waste properly will help the government's efforts in dealing with waste problems and public health problems caused by these waste problems. Proper behavior in managing waste needs to be instilled and intensified so that all people in Indonesia can do it. It is necessary to introduce environmental values to the community, so people will understood and can manage waste properly and reduce the amount of waste (Widyaningsih et al., 2015).

Based on the results of statistical tests on the variable level of knowledge about household waste management and the incidence of diarrhea in toddlers shown in Table 3, the p-value was 0.373, and the value C = 0.269. It meant the level of knowledge about household waste management and the incidence of diarrhea in toddlers had no significant relationship and was supported by the value of C that indicated the level of strength of the relationship between the two variables was weak. Respondents' knowledge about household waste management had the highest number of respondents at very good (20 people; 50%), it meant some of them (16 people; 40%) didn't have diarrhea in their toddlers. A high or good level of knowledge about household waste management would underlie that someone behaves well in terms of managing waste and waste problems could be handled properly so that would reduce the risk of diarrhea in toddlers.

The weak level of relationship strength and the p-value results (no significant relationship) between respondents' knowledge and the incidence of diarrhea in toddlers for this study, wasn't followed by other studies which stated that there was a significant relationship between knowledge and the incidence of diarrhea (using Spearman rank statistical test p-value 0.000 and r 0.395); the correlation coefficient value (r = 0.395) indicated that the relationship between respondent's' knowledge and the incidence of diarrhea was in the weak category (Riyanto and Adifa, 2016). Another study also showed the same results (but weren't followed in this study) that concluded that the variables of maternal knowledge and the incidence of diarrhea in toddlers had a significant relationship (Febrianti, 2019). Similar research wasn't in line with this study and also explained that there was a relationship between maternal knowledge and the incidence of diarrhea in toddlers (the chi-square test produced p-value = 0.040) (Putra, Rahardjo and Joko, 2017).

Another study with different results and in line with this study showed there was no a relationship between maternal

knowledge and the incidence of diarrhea after analysis by statistical tests, (with the chi-square test, the p-value was 0.536) (Jannah, Kepel and Maramis, 2016). Someone who has good knowledge doesn't necessarily apply clean and healthy behavior (PHBS) in his daily life. Based on previous research, it was explained that what respondents knew and understood related to environmental health (especially PHBS) wasn't applied in their daily actions, and in the incidence of diarrhea it was stated there were other factors that influenced, namely cultural factors (Jannah, Kepel and Maramis, 2016).

The knowledge regarding household waste management in Sedah Kidul Village wasn't good yet, this was known based on observations when conducting the research. The trash cans in the citizens' houses were open and, in the village, there was no TPS or TPA so this made people tend to burn piles of rubbish in their yards. The results of statistical test analysis on the variable availability of waste management facilities in the household with the incidence of diarrhea in toddlers are shown in Table 3, resulting p-value = 0.380 and value of C = 0.267. It meant there was no significant relationship and was supported by the C value that indicated the availability of waste management facilities in the household environment and the incidence of diarrhea in toddlers in the Sedah Kidul village had a weak relationship. Very good availability of household waste management facilities in Sedah Kidul Village (26 people; 65%) could be seen from the existence of trash cans in front of the houses of most people which was supported from the village, but it wasn't supported by the provision of TPA or TPS in the village for advanced waste management process. So, even though there were trash cans in each house but there was no garbage transportation to the TPA or TPS, people finally chose to burn their waste in their yards. It could reduce the lure of flies to land on the garbage heap.

The weak strength of the relationship between the availability of household waste management facilities and the incidence of diarrhea in toddlers for this study indicated that actually there might be no significant relationship between these variables; this was supported by other research which explained that there was no significant relationship between the condition of landfills and the incidence of diarrhea in toddlers (the chi-square test results p-value = 0.06). It was also known that waste was processed by burning in the yard of the house so it didn't cause a pile of garbage (Oktariza, Suhartono and Dharminto, 2018). A similar study also stated that there was no relationship between the type of landfill with the incidence of diarrhea in toddlers (chi-square statistical test resulted in p-value = 0.303) (Arimbawa, Dewi and Ahmad, 2016). The same conclusion was found in the relationship between the condition of the landfill with the incidence of diarrhea in toddlers, that there was no relationship described in other studies but with a different p-value = 0.255 and using the same statistical test as the previous study (Langit, 2016).

A similar study about the condition of house waste disposal with the incidence of diarrhea in toddlers concluded that there was no significant relationship between the two variables (chi-square statistical test resulted in p-value = 0.063) (Sidhi, Raharjo and Dewanti, 2016). The condition of the landfill in the household that was one of the components of basic sanitation that might not directly affect the incidence of diarrhea; however, the condition of the landfill could trigger the presence or absence of vectors which carried pathogenic microorganisms that cause diarrhea. Poor conditions for landfills could trigger a high density of flies and could contaminate food or drinks and this would cause diarrhea, especially in toddlers (Putri and Susanna, 2020). In contrast to the previous research described, other studies explained that the condition of the family waste disposal facilities and the incidence of diarrhea had a relationship, with the chi-square statistical test resulted in a p-value of 0.017 (Irfan and Delima, 2018).

Similar results of the research also stated that the quality of household waste disposal facilities had a relationship with the incidence of diarrhea in toddlers (chi-square statistical test yields a p-value of 0.019) (Putra, Rahardjo and Joko, 2017). The type of trash can, whether open or closed, was also known to have a significant relationship with the incidence of diarrhea in toddlers (chi-square test with p-value 0.028) (Fauzi, Setiani and Raharjo, 2015).

The third variable (household waste management behavior), which was tested statistically with the incidence of diarrhea in toddlers, showed the test results presented in Table 3, resulting in p-value = 0.763 and a value of C = 0.168. This meant there was no significant relationship between household waste management behavior and the incidence of diarrhea in toddlers, supported by the value of C which showed the strength of the relationship was in the very weak category. In Sedah Kidul Village, the community's behavior in managing waste is mostly done by burning garbage in their yard; this could reduce the pile of garbage. Burning garbage aimed to reduce the amount, usually in the morning or evening. Waste management by burning would reduce the interest of vectors which carried pathogenic microorganisms that cause diarrhea (such as flies), so it could be minimized and prevent the incidence of diarrhea in the community, especially in toddlers.

With the very weak relationship between waste management behavior at the household level and the incidence of toddlers' diarrhea in Sedah Kidul Village, it also could be said that the two variables didn't have a significant relationship. It was reinforced by other studies that were in line, and the study explained that household waste management had no significant relationship with the incidence of diarrhea in infants (Dhiana, Hestiningsih and Yuliawati, 2017). Preventing piles of rubbish was done by some people in the working area of the Kedungmundu Health Center, especially in the village area by burning it, while in residential areas the garbage was collected by garbage officers periodically. Similar studies have concluded that there was no significant relationship between waste management and the incidence of diarrhea (Putri and Susanna, 2020). And other studies, which also examined the relationship between waste management and the incidence of diarrhea, analyzed by the chi-square test, yielded a p-value of 0.605, which indicated that there was no relationship between the two variables. It also explained that the absence of a relationship between the two variables was due to diarrheal disease that was not only caused by environmental factors such as unhygienic waste disposal but could be influenced and caused by many other factors (Tarigan and Munthe, 2018). In contrast to previous studies, other studies have obtained results that showed waste management had a significant relationship with the incidence of diarrhea (the chi-square test produced a p-value of 0.043) (Dini, Machmud and Rasyid, 2015).

This study was in line with previous studies which found that there was no significant relationship between the level of knowledge, facilities, and behavior of household waste management and the incidence of toddlers' diarrhea. The fact that was different from previous research was that the community in Sedah Kidul Village already had a very good level of knowledge regarding household waste management, but it wasn’t fully applied in behavior or actions in everyday life. This was because the waste management facilities were less supportive. Sedah Kidul Village doesn't yet have a TPA or TPS as a container for advanced waste management. So to solve the problem of piles of garbage, the community prefers to burn rubbish; this was causing diarrhea for toddlers in Sedah Kidul Village to have no significant relationship with the level of knowledge, facilities, and behavior of respondents in managed waste. The weakness of this study is related to the size of the sample used as respondents, where the

number is too small, so it is less sensitive to detect any relationship between variables.

CONCLUSION

Based on the research, it was known that most respondents were female (95%), aged 30 years and over (57.5%), last education was an elementary school (40%), and were housewives (75%). The results of cross-tabulation and statistical tests showed that there was no significant relationship between the level of respondents' knowledge, availability of facilities, and respondents' behavior related to household waste management and the incidence of diarrhea among toddlers in Sedah Kidul Village. It was supported by the C value or the contingency coefficient, which, for the three variables, showed the strength of the relationship was in the weak and very weak categories. The level of knowledge about household waste management (C = 0.269) was in the weak category, the availability of household waste management facilities (C = 0.267) was in the weak category, and household waste management behavior (C = 0.168) was in the very weak category in the relationship with the incidence of diarrhea in toddlers in Sedah Kidul Village. The community in Sedah Kidul Village carried out waste management by burning piles of garbage in their respective yards.

Suggestions for the village government are that it is necessary to provide TPA or TPS facilities to support the management and handling of waste problems properly so the next waste management processes can be carried out. The principle of 3R waste management needs to be further introduced and implemented in the community so that it can help reduce and handle waste and can increase environmental sanitation efforts and thereby prevent diseases caused by waste problems.

REFERENCE

Arimbawa, I.W., Dewi, K.A.T. and Ahmad, Z. Bin, 2016. Hubungan Faktor Perilaku Dan Faktor Lingkungan Terhadap Kejadian Diare Pada Balita Di Desa Sukawati, Kabupaten Gianyar Bali Tahun 2014. *Intisari Sains Medis*, [online] 6(1), pp.8–15. https://doi.org/10.15562/ism.v6i1.14

Astutik, E., Efendi, F., Sebayang, S.K., Hadisuyatmana, S., Has, E.M.M. and Kuswanto, H., 2020. Association between women's empowerment and diarrhea in children under two years in Indonesia. *Children and Youth Services Review*, [online] 113(April), p.105004. Available at: https://doi.org/10.1016/j.childyouth.2020.105004.

Bellona, H.F. and Lagiono, 2015. Tinjauan Pengelolaan Sampah Taman Kota Andhang Pangrenan Kecamatan Purwokerto Selatan Kabupaten Banyumas Tahun 2014. *Jurnal Kesehatan Lingkungan, Politeknik Kesehatan Kemenkes Semarang*, [online] 34, pp.131–135. https://doi.org/10.31983/keslingmas.v34i3.3057

Bureau of Communication and Community Services Ministry of Health Republic of Indonesia, 2019. *Derajat Kesehatan 40% Dipengaruhi Lingkungan*. [online] wwwSehatnegeriku.kemkes.go.id.

Centers for Disease Control and Prevention, 2013. Diarrhea: Common Illness, Global Killer. *Centers for Disease Control and Prevention*, [online] 19(3), pp.1–4.

Centers for Disease Control and Prevention (CDC), 2015. *Global Water, Sanitation, & Hygiene (WASH)*. [online] Centers for Disease Control and Prevention (CDC).

Dhiana, W.R., Hestiningsih, R. and Yuliawati, S., 2017. Faktor Risiko Pola Asuh terhadap Kejadian Diare Bayi (0-12 bulan) Di Wilayah Kerja Puskesmas Kedungmundu Kecamatan Tembalang Kota Semarang. *Jurnal Kesehatan Masyarakat (e-Journal)*, [online]

5(4), pp.525–532.

Dini, F., Machmud, R. and Rasyid, R., 2015. Hubungan Faktor Lingkungan dengan Kejadian Diare Balita di Wilayah Kerja Puskesmas Kambang Kecamatan Lengayang Kabupaten Pesisir Selatan Tahun 2013. *Jurnal Kesehatan Andalas*, [online] 4(2), pp.453–461. Available at: https://doi.org/10.25077/jka.v4i2.271.

Fauzi, Y., Setiani, O. and Raharjo, M., 2015. Analisis Sarana Dasar Kesehatan Lingkungan yang Berhubungan dengan Kejadian Diare pada Anak Balita di Kecamatan Gading Cempaka Kota Bengkulu. *Jurnal Kesehatan Lingkungan Indonesia*, [online] 4(2), pp.39–48. Available at: https://doi.org/10.14710/jkli.4.2.39 - 48.

Febrianti, A., 2019. Hubungan Faktor Sosial Ekonomi, Pengetahuan Ibu Tentang Lingkungan Sehat Dan Diare Dengan Kejadian Diare Pada Balita Usia 1-5 Tahun Di Puskesmas Pembina Palembang. *Journal Of Midwifery And Nursing*, [online] 1(3), pp.18–23.

Government Regulation of the Republic of Indonesia Number 81 of 2012 concerning Management of Household Waste and Waste of Similar Types of Household Waste. Resources. [online]

Gusti, A., Isyandi, B., Bahri, S. and Afandi, D., 2015. Hubungan Pengetahuan, Sikap dan Intensi Perilaku Pengelolaan Sampah Berkelanjutan Pada Siswa Sekolah Dasar di Kota Padang. *Dinamika Lingkungan Indonesia*, [online] 2(2), p.100. https://doi.org/10.31258/dli.2.2.p.100-107

Healthy People, 2020. *Social Determinants of Health*. [online] www.healthypeople.gov.

Irfan, A. and Delima, 2018. Sarana Sanitasi Dasar dengan Kejadian Diare pada Balita. *Jurnal Sehat Mandiri*, [online] 13(2), pp.42–47. Available at: https://doi.org/10.33761/jsm.v13i2.59.

Jannah, M.F., Kepel, B.J. and Maramis, F.R.R., 2016. Hubungan Antara Pengetahuan Dan Tindakan Pencegahan Ibu Dengan Kejadian Diare Pada Balita Di Puskesmas Tikala Baru Kota Manado. *Pharmacon*, [online] 5(3), pp.211–217. Available at: https://doi.org/10.35799/pha.5.2016.12976.

Langit, L.S., 2016. Hubungan Kondisi Sanitasi Dasar Rumah Dengan Kejadian Diare Pada Balita Di Wilayah Kerja Puskesmas Rembang 2. *Jurnal Kesehatan Masyarakat (e-Journal)*, [online] 4(2), pp.160–165.

Latif, S.A., Omar, M.S., Bidin, Y.H. and Awang, Z., 2012. Environmental Problems and Quality of Life: Situational Factor as a Predictor of Recycling Behaviour. *Procedia - Social and Behavioral Sciences*, [online] 35(December 2011), pp.682–688. Available at: http://dx.doi.org/10.1016/j.sbspro.2012.02.137.

Mills, J.E. and Cumming, O., 2016. The impact of water, sanitation and hygiene on key health and social outcomes. *UNICEF*, [online] Jun., pp.1–110.

Ministry of Health of the Republic Indonesia, 2011. Situasi diare di Indonesia. *Jurnal Buletin Jendela Data & Informasi Kesehatan*, 2, pp.1–44.

Mulatya, D.M. and Ochieng, C., 2020. Disease burden and risk factors of diarrhoea in children under five years: Evidence from Kenya's demographic health survey 2014. *International Journal of Infectious Diseases*, [online] 93, pp.359–366. Available at: https://doi.org/10.1016/j.ijid.2020.0

2.003.

Munyai, O. and Nunu, W.N., 2020. Health effects associated with proximity to waste collection points in Beitbridge Municipality, Zimbabwe. *Waste Management*, [online] 105, pp.501–510. Available at: https://doi.org/10.1016/j.wasman.2020.02.041.

Nurfita, D., 2017. Faktor-Faktor yang Berhubungan dengan Kejadian Diare pada Balita di Puskesmas Bulu Lor Kota Semarang. *Kes Mas: Jurnal Fakultas Kesehatan Masyarakat*, [online] 11(2), pp.149–154.

Oktariza, M., Suhartono and Dharminto, 2018. Gambaran Kondisi Sanitasi Lingkungan Rumah dengan Kejadian Diare pada Balita di Wilayah Kerja Puskesmas Buayan Kabupaten Kebumen. *Jurnal Kesehatan Masyarakat (e-Journal)*, [online] 6(4), pp.476–484. https://doi.org/10.31602/ann.v6i2.2680

Putra, A.D.P., Rahardjo, M. and Joko, T., 2017. Hubungan Sanitasi Dasar Dan Personal Hygiene Dengan Kejadian Diare Pada Balita Di Wilayah Kerja Puskesmas Tasikmadu Kabupaten Karanganyar. *Jurnal Kesehatan Masyarakat (e-Journal)*, [online] 5(1), pp.422–429.

Putri, S.R. and Susanna, D., 2020. Kondisi Sanitasi Dasar dengan Kejadian Diare di Kawasan Pesisir Pantai Desa Sedari, Kabupaten Karawang, Jawa Barat Tahun 2018. *Jurnal Nasional Kesehatan Lingkungan Global*, [online] 1(2), pp.115–121. Available at: http://dx.doi.org/10.7454/.v1i2.3833.

Research and Development Agency for Health Ministry of Health of the Republic Indonesia, 2018. *Hasil Utama Riset Kesehatan Dasar 2018*. [online] *Kementrian Kesehatan Republik Indonesia*.

Ridlo, I.A., Laksono, A.D., ridwanah, azizah andzar and Yoto, M., 2019. Intervensi Berbasis Komunitas: Sebuah Pengantar. pp.1–18. https://doi.org/10.31227/osf.io/2fpjz

Riyanto, E. and Adifa, R.F.N., 2016. Hubungan Tingkat Pengetahuan, Pendidikan, Dan Pola Hidup Bersih Dan Sehat Ibu Terhadap Kejadian Diare Pada Balita Di Puskesmas Sitopeng Kota Cirebon. *Jurnal Kedokteran & Kesehatan*, [online] 3(4), pp.1–8. https://doi.org/10.31934/promotif.v8i1.224

Saputra, Sangga N.S,. and Mulasari, S.A., 2017. Pengetahuan, Sikap, dan Perilaku Pengelolaan Sampah pada Karyawan di Kampus. *Kes Mas: Jurnal Fakultas Kesehatan Masyarakat Universitas Ahmad Dahlan*, [online] 11(1), pp.22–27.

Santika, N.K.A., Efendi, F., Rachmawati, P.D., Has, E.M.M. ah, Kusnanto, K. and Astutik, E., 2020. Determinants of diarrhea among children under two years old in Indonesia. *Children and Youth Services Review*, [online] 111(December 2019), p.104838. Available at: https://doi.org/10.1016/j.childyouth.2020.104838.

Sidhi, A.N., Raharjo, M. and Dewanti, N.A.Y., 2016. Hubungan Kualitas Sanitasi Lingkungan Dan Bakteriologis Air Bersih Terhadap Kejadian Diare Pada Balita Di Wilayah Kerja Puskesmas Adiwerna Kabupaten Tegal. *Jurnal Kesehatan Masyarakat (e-Journal)*, [online] 4(3), pp.665–676.

Suherman and Aini, F.Q., 2019. Analisis Kejadian Diare pada Siswa di SD Negeri Pamulang 02 Kecamatan Pamulang Tahun 2018. *Jurnal Kedokteran Dan Kesehatan*, [online] 15(2), pp.199–208. Available at: https://doi.org/10.24853/jkk.15.2.199-208.

Sukmawati, E., Hasyim, A. and Yanzi, H., 2016. Pengaruh Keterlibatan Siswa

Dalam Kegiatan Palang Merah Remaja Terhadap Pembentukan Keterampilan Sosial. *Jurnal Kultur Demokrasi*, [online] 5(6), pp.1–15.

Tarigan, M. and Munthe, S.A., 2018. Pengaruh Kualitas Air Sumur Gali Dan Pembuangan Sampah Terhadap Kejadian Diare Di Desa Tanjung Anum Kecamatan Pancur Batu Kabupaten Deli Serdang. *Jurnal Saintika*, [online] 18(1), pp.1–7.

Wahana, S. and Rochmania, A., 2019. Hubungan Hidup Bersih dan Sehat dengan Tingkat Kebugaran Jasmani Siswa Kelas X di SMAN 2 Lamongan. *JOSSAE : Journal of Sport Science and Education*, 3(2), p.103. https://doi.org/10.26740/jossae.v3n2.p103-111

Widyaningsih, N., Tjiptoherijanto, P., Widanarko, S. and Seda, F.S., 2015. Linkage Model Between Sustainable Consumption and Household Waste Management. *Procedia Environmental Sciences*, [online] 28(SustaiN 2014), pp.195–203. Available at: http://dx.doi.org/10.1016/j.proenv.2015.07.026.

Wijaya, Y., 2012. Faktor Risiko Kejadian Diare Balita Di Sekitar TPS Banaran Kampus Unnes. *Unnes Journal of Public Health.*, [online] 1(2). Available at: https://doi.org/10.15294/ujph.v1i2.3050.