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Correlation between clean and healthy lifestyle behavior of mother with the incident of diarrhea in toddlers at working area of Puskesmas I Negara, Jembrana - Bali

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ABSTRACT

Background: Diarrhea defines as the increase of defecation frequency more than usual, which is more than three times per day, accompanied by the change of feces' consistency become way waterier with or without blood and mucus. Risk factors that can cause diarrhea included the transmission of bacteria, immune deficiency from the host increases the vulnerable towards diarrhea and environment factor along behavior. The combination of unhealthy environmental factors because of tainted diarrhea bacteria and bad human behavior was the main cause of diarrhea. This research aims to know the correlation between clean and healthy lifestyle behavior of mother with the incidents of diarrhea in toddlers.

Methods: This research is an analytic study with cross-sectional approach. The data of this study were collected through questionnaire. The data were analyzed by univariate and bivariate.

Results: 50 samples were included in this study with 58% aged 20-30 years old. Bivariate analysis showed that clean and healthy lifestyle behavior category of mother, washing hand, and toilet usage were correlated with the incidence of diarrhea in toddlers with PR (p-value) consecutively 1,9 (p=0.028); 3.9 (p=0.004); and 6.25 (p=0.002).

Conclusions: Majority of respondents have bad clean and healthy lifestyle behavior (CHLB) category, and the incidence of diarrhea in toddler tends to be more in mothers with bad clean and healthy lifestyle behavior (CHLB) category.

Keywords: clean and healthy lifestyle behavior (CHLB), diarrhea in toddler

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INTRODUCTION

Diarrhea is one of the most common health problems. Diarrhea is more common in developing countries than in developed countries. Diarrhea is an endemic disease in Indonesia and an extraordinary potential disease (KLB) that often accompanies death, especially in infants and toddlers.[1]

Data from WHO, it was reported that the main causes of death in infants were diarrhea (post-neonatal), 14% and pneumonia 14%, malaria 8%, non-infectious diseases 4%, 3% injury, HIV Human Immunodeficiency Virus) (Acquired Immunodeficiency Syndrome) 2%, 1% measles, and another 13%. While death from diarrhea in infants <1 month of age is as much as 2%.[2]

Based on data from MOH RI in 2008, diarrhea is the main cause of death in infants (31.4%) and children under five (25.2%). A total of 162,000 children die from diarrhea every year or about 460 toddlers per day. Based on the results of the household health survey (SKRT) in the MOHRI in 2011, diarrhea is the second leading cause of death in infants, number three in infants, and number five for all ages. It is estimated that every child in Indonesia experienced episodes of diarrhea as much as 1.6-2 times per year.[2]

Survey of morbidity performed by Diarrhea Submit, Ministry of Health RI from the year 2000-2010 seen inclination rise. In 2000 the incidence rate (IR) of diarrheal diseases was about 301/1000 inhabitants, in 2003 rose to 374/1000 inhabitants, in 2006 rose to 423/1000 inhabitants and in 2010 to 411/1000 inhabitants. Extraordinary events (KLB) due to diarrhea are also still common, with Case Fatality Rate (CFR) is still high. In 2008, there were outbreaks in 69 districts with 8133 cases and total deaths 239 people (CFR 2.94%). In 2009 there were outbreaks in 24 districts with 5,756 cases and 100 deaths (CFR 1.74%), while in 2010 there were outbreaks of diarrhea in 33 districts with 4204 patients and 73 deaths (CFR 1.74 %).[2]

Based on data from the Bali Provincial Health Office in 2015, the case of diarrhea is a fairly common case found in Bali. In 2015 found cases of diarrhea around 88,870 people, this figure increased compared to the year 2014 which amounted to 87,845 people. While diarrhea cases handled 79,254 cases (89.2%) increased from 2014 by 79.5% and diarrhea morbidity rate was 214 per 1000 population.[1] The discovery of cases of diarrhea in infants

in the working area of Puskesmas I Negara in 2016 was 647 people. This figure has increased quite high compared to previous years, wherein 2015 as many as 177 toddlers, in 2014 as many as 303 toddlers, in 2013 as 155 children under five, and in 2012 as many as 125 children under five.[3]

Diarrhea is defined as a change in stool consistency (more watery than usual) and increased frequency of bowel movements three or more times but not bleeding within 24 hours.[1] Diarrhea is transmitted by fecal-oral, through food or drink contaminated by enteropathogens, direct hand contact with the patient, items that have been contaminated with feces or indirectly through flies. This mode of transmission is known as 4F, i.e., finger, flies, fluid, field.

Diarrhea that is not treated immediately will cause dehydration and growth disorders in infants. Dehydration is caused because the intestine does not work perfectly, so most of the water and dissolved substances in it are thrown away with the stools so that the body is dehydrated. At the age of toddlers are more susceptible to dehydration because of the difficulty of giving fluids by mouth than other age groups. Comparatively large fluid composition in infants, i.e., as much as 80-85% of as much weight and in children aged> 1 year as much as 70-75% of body weight is also one factor of children aged under five are more susceptible to dehydration compared to other ages. Loss of body fluids as much as 10% in infants can cause death after illness for 2-3 days.[4]

Growth disorders due to diarrhea can occur due to reduced food intake, while nutrient expenditure continues. A decreased appetite that occurs during diarrhea resulted in reduced food intake. Infections caused by diarrhea also contribute to lack of energy, protein, and other nutrients. The energy requirement during the occurrence of infection increases twice the normal requirement due to an increase in basal metabolism by 20-60%. Decreased intake of food in a long time coupled with an increase in energy demand during the occurrence of infection will result in malnourished toddlers that inhibit the physical growth and development of brain intelligence.[4]

Risk factors that can cause diarrhea include the spread of germs decreased immunity from host factors that increase susceptibility to diarrhea, and environmental and behavioral factors. The combination of unhealthy environmental factors due to contamination of diarrheal germs and unhealthy human behavior is the cause of diarrhea. Therefore, one of the important diarrhea prevention efforts is the application of clean and healthy life in everyday life because diarrhea diseases are closely related to sanitation hygiene and clean and healthy life behavior.[5]

According to data from WHO, the behavior of clean and healthy living by washing hands with soap can reduce diarrhea rate up to 47%.[6] Based on an environmental service program (ESP) survey of community behavior on hand washing practices conducted by MOH and other agencies, it was found that only 12% were washing hands after bowel movements. The low behavior of CTPS also appears at 4 other critical times, i.e., only 9% do CTPS after helping to defecate, only 14% of CTPS were done before meals, 7% before feeding the baby and 6% before preparing the food. It is proven that CTPS can prevent up to 80% of various infectious diseases including diarrhea, and can prevent 45% of serious infectious diseases, such as ISPA, avian influenza, worms and so on.[2]

Behavior is one factor that plays an important role in determining health status. Behavior that is not clean and healthy will cause various diseases. Behavior change is not easy to do, but necessary to improve health status. The clean and healthy living behavior in the field of prevention of diarrhea among children by exclusive breastfeeding, improving the way weaning, using clean water, washing hands with soap and running water, using a closed toilet and dispose of baby feces properly and properly, consuming food clean and healthy, and maintain the cleanliness of the house and environment.[5]

Based on this background, the researcher wanted to conduct research entitled "Relationship of Clean and healthy lifestyle behavior of Mother to Diarrhea Occurrence in Toddler at Working Area of Puskesmas I Negara."

METHODS

This research is an analytic study with cross-sectional approach. The study was conducted in the working area of Puskesmas I Negara, Jembrana, Bali in September 2017. The study sample was all mother who have children under five years old at working area of Puskesmas I Negara with inclusion criteria were mother who has children aged < 5 years old, living in the working area of UPT Puskesmas I Negara, able to communicate well, willing to participate as a research subject and sign informed consent. Exclusion criteria were prospective respondents under the circumstances of not possible to answer the questionnaire and were not willing to participate as research subjects. Based on the calculation result, it takes a minimum number of samples of 50 people.

The working area of Puskesmas I Negara consists of 6 villages, namely Berangbang village, Baler Bale

Agung village, Banjar Tengah village, Kaliakah village, Baluk village, and village Banyubiru. From the 6 villages, two villages were chosen by simple random sampling technique. Then elected village of Banyubiru and BB Agung. From each village selected one posyandu by the schedule of research, elected 2 posyandu the Posyandu Dharma Bakti village BB Agung and posyandu Dharma Laksana II village Banyubiru. From each posyandu will be taken all mothers who meet the criteria for inclusion.

The research instrument used in this research was the questionnaire used by Sari and has been validated by r count > 0.444 at α = 5% and N = 20. While in the reliability test the value of r alpha is 0.952. These results indicate that the questionnaire of Clean and Healthy Life Behavior (PHBS) of mothers is said to be valid and reliable so it can be used as a measuring tool.

Data collection was done by filling out questionnaires and interviews. Informed consent of the respondents was made to ensure willingness in filling out questionnaires and interviews; then the respondents were asked to complete the question based on the questionnaire available. The data have been analyzed using SPSS software descriptively and bivariate analysis (chi-square test) to know the relation between independent variable with the dependent variable.

RESULT

Based on table 1. on the frequency of respondent characteristics in the working area of Puskesmas I Negara found that most of the respondents were in the age group 20-30 years (58%), parity more than twice (74%), and most of the mother did not work (86%), with the highest education level of the mother with low education level (56%), family income> Rp 2.000.000,00 (52%). For toddlers, most aged 1-12 months (50%), had no history of food allergy (100%) and had no history of congenital gastrointestinal disorders (100%).

Based on table 2, the frequency of Clean and Healthy Lifestyle Behavior (CHLB) of the mother, was found to be the most in the bad CHLB category (60%). While for the CHLB category, 20 respondents (40%) with exclusive breastfeeding frequency were 21 (42%), clean water use 33 (66%), hand washing 12 (24%) and healthy toilet 10 (20%) of respondents. The number of children with diarrhea is 27 toddlers (54%), whereas children without diarrhea are 23 (46%).

Based on the cross-tabulation in Table 3, it was found that the incidence of diarrhea tended to be higher among mothers with poor Clean and Healthy Behavior, from 30 respondents found as many as 20 respondents had diarrhea (67%), the remaining 10 respondents (33%) did not have diarrhea. In this research, the result p = 0,028. In addition to the prevalent ratio, mothers who performed poor Clean and healthy lifestyle behavior in under-fives were 1.9 times more likely to have diarrhea compared to good maternal Clean and Healthy Behavior. The incidence of diarrhea tended to be higher in mothers by false hand washing, from a total of 38 respondents, it found as many as 25 respondents had diarrhea (65.8%), the rest 13 respondents (34.2%) did not experience diarrhea (p = 0.004). In the prevalent ratio (PR) was found that improper hand washing

Table 1 Characteristic of Respondents in Work Area of Puskesmas I Negara

Characteristic of Responden	Frequancy (n=50)	Percentage (%)
Mother age group (years)		
<20	1	2.0
20-30	29	58.0
>30	20	40.0
Toddler age (months)		
1-12	25	50.0
13-24	15	30.0
25-36	5	10.0
37-48	4	8.0
49-59	1	2.0
Parity		
<2	13	26.0
≥2	37	74.0
Allergy to Food History		
Yes	-	-
No	50	100.0
Total	50	100.0
Mothers work		
No work	43	86.0
Work	7	14.0
Education Level of Mother		
Low	28	56.0
High	22	44.0
Family Income		
<Rp 2.000.000,00	24	48.0
>Rp 2.000.000,00	26	52.0
Congenital Digestive Disorder History		
Yes	0	0.0
No	50	100.0

Table 2 The frequency of Clean and Healthy Lifestyle Behavior of Mother and Diarrhea Occurrence in Under Fives Years Old Toddler at Working Area of Puskesmas I Negara

Research variable		Frequency (n-50)	Percentage (%)
CHLB Category of mothers	Good	20	40.0
	Bad	30	60.0
Water usage	Clean	33	66.0
	Not clean	17	34.0
Washing hands	True	12	24.0
	False	38	76.0
Toilet Usage	Healthy	10	20.0
	Not healthy	40	80.0
Diarrhea in Toddlers	Yes	27	54.0
	No	23	46.0
Total		50	100,0

Table 3 Cross-tabulation of Clean and Healthy Lifestyle Behavior of Mother with Diarrhea Occurrence in Under Fives Years Old Toddler at Working Area of Puskesmas I Negara

	Diarrhea Occurrence				Total (n=50)			
	Diarrhea		No Diarrhea					
Research variable	Σ	%	Σ	%	Σ	%	PR	P
CHLB Category of mothers								
Good	7	35.0	13	65.0	20	100.0	1.9	0.028
Bad	20	67.0	10	33.0	30	100.0		
Water Usage								
Not clean	10	59.0	7	41.0	17	100.0	1.1	0.425
Clean	17	52.0	16	48.0	33	100.0		
Washing hands								
False	25	65.8	13	34.2	38	100.0	3.9	0.004
True	2	16.7	10	83.3	12	100.0		
Toilet usage								
Not healthy	25	62.5	14	37.5	40	100.0	6.25	0.002
Healthy	1	10.0	9	90.0	10	100.0		

was 3.9 times higher in diarrhea than washing the hands properly. Furthermore, in terms of the use of latrines, data obtained that the incidence of diarrhea tends to be more in mothers with unhealthy toilet use, from total of 40 respondents, it found as many as 25 respondents experienced diarrhea (62.5%), the rest 14 respondents (37.5%) did not experience diarrhea (p = 0,002). In mothers with unhealthy or unhealthy latrines can be 6.25 times more likely to experience diarrhea compared with the use of healthy latrines. While the use of clean water is not found any significant relationship with the incidence of diarrhea in toddlers.

DISCUSSION

Relationship of Clean and Healthy Lifestyle Behavior in Mother with Diarrhea Occurrence in Under Fives Years Old Toddler at Work Area of Puskesmas I Negara

Based on the results of the study, it was found that the majority of respondents who did a clean and healthy life behavior with as many as 20 respondents, seven of whom had experienced diarrhea (35%) while 13 respondents (65%) never experienced diarrhea. In the majority of respondents with bad Clean and healthy lifestyle behavior as many as 30 respondents found as many as 20 respondents had diarrhea (67%), the remaining 10 respondents (33%) never experienced diarrhea. In this research, the result p = 0,028. The value of the research results obtained is lower than 0.05 which states that there is a significant relationship between the clean and healthy life behavior of the mother with the incidence of diarrhea in infants. Implementation of poor mothers Clean and healthy lifestyle behavior can be risky 1.9 times a toddler has diarrhea. This is supported by research from Utari in 2009 which says that there is a significant relationship between clean and healthy life behavior with diarrhea occurrence.[7] Subagijo states that people who have a clean and healthy lifestyle that is not good have a 3.5 times greater risk of suffering from diarrhea.[8]

Health in children is strongly influenced by the participation of parents. Parents determine the choice of quality health services received by their children, including the foods they eat, the amount of physical activity performed, the emotional support provided, and the quality of their environment before and after birth. The most dominant caregiver role in the child in the family is a mother. This is also in line with research from Kusumaningrum et al. in 2011 which states that there is a relationship between clean and healthy lifestyle behavior household order with the incidence of diarrhea in infants.[9]

Clean and healthy lifestyle behavior is a set of behaviors practiced by awareness as a result of learning that makes a person, family, group or community able to help themselves (independently) in the field of health and play an active role in realizing public health. The application of good Clean and healthy lifestyle behavior can affect behavior to prevent diarrhea in children better, so it is expected that the condition will directly affect the decrease in the incidence of diarrhea in infants. Clean and healthy lifestyle behavior is one of health promotion in Indonesia which operates five targeted setting, i.e., household, educational institution, workplace health institution, and public

place. The importance of Clean and healthy lifestyle behavior should be known to the public because health conditions can be achieved by changing behavior from unhealthy to healthy behaviors and creating a healthy environment. In this case, Clean and healthy lifestyle behavior in the household is closely related to diarrhea problems in infants. The family Clean and healthy lifestyle behavior indicator is a measuring tool to assess the state or health problems in the family.[10] There are 10 indicators of Clean and healthy lifestyle behavior in the household; four indicators are related to diarrhea that is breastfeeding exclusive use of clean water, hand washing properly, and the use of healthy latrines.

The relationship between Clean Water Use with Diarrhea Occurrence in Under Fives Years Old Toddler at Work Area of Puskesmas I Negara

The result of the univariate analysis showed that from 50 respondents, 33 (66%) of respondents use clean water that fulfills health condition and 17 (34%) of respondents who do not use clean water. Use of a good water source is a good use of protected water sources. Some respondents have used PAM means that water source is protected as a source of drinking water for the family, the rest still use the source of water coming from the well.

The result of the bivariate analysis shows that p-value in this research is 0,425 which means that there is no relation between clean water usage and diarrhea occurrence in toddler in working area of Puskesmas I Negara. Of the respondents who use clean water that meets health requirements, as many as 52% have a toddler who had suffered from diarrhea in one month. It is because diarrhea is a disease caused by multifactor. Respondents who use clean water who already meet health requirements, but have a toddler who still experienced diarrhea, caused by there are still respondents who have bad habits regarding hand washing properly and the use of latrines, and not give exclusive breastfeeding. Nuraeni in his study found that poor water use can cause diarrhea 72.7%. The use of unclean water can be at risk 10,311 times affected by diarrhea. This study shows that respondents who do not use clean water facilities that meet physical requirements can be risky for children with diarrhea. But it does not close the possibility of diarrhea due to contamination of water by bacteria during the taking, processing, and storage of water as well as the behavior of the community when cooking and utilizing the means.[10] Research from Yulisa in 2008 showed there was significant influence between family water source with diarrhea incidence with p-value = 0.0001 and OR 17,7.[11] Apriyanti (2009) also stated that diarrhea could be caused by still at least people who manage household drinking water properly. In this study, the use of clean water by health requirements such as drinking water sources from PDAM can reduce the risk of diarrhea in infants.[12]

Water is one of the basic needs of humans; even the human body contains 70% water. Water is used for food, drinking, bathing, and other needs. Water can also be a means of spreading infectious diseases. Minister of Health Regulation No. 416 of 1990 states that the physical properties of clean water are tasteless, odorless, and colorless. Use of clean water can prevent the transmission of diarrheal germs by oral-fecal. The risk of transmission of diarrhea can be reduced by using clean water and protecting the water from contamination from the source to storage at home. Water management by cooking water to boil is an attempt to kill pathogenic germs contained in drinking water and make the water safe to drink.[13]

The relationship between Handwashing with Diarrhea Occurrence in Under Fives Years Old Toddler at Work Area of Puskesmas I Negara

Personal hygiene is important in preventing the transmission of germs diarrhea is a habit of washing hands. The result of univariate analysis from 50 respondents, there were 38 (76%) respondents who did not wash their hands properly, and only 12 (24) respondents wash their hands properly. The majority of respondents simply wash their hands simply and rinsed with water without using soap.

Based on bivariate analysis p-value in this research is 0,004 which means there is a correlation between mother Clean and healthy lifestyle behavior relationship with diarrhea incident in under five in working area of Puskesmas I Negara. Of 38 respondents who did not wash their hands properly, there were 25 (65,8%) of them had diarrhea in the last 1 month. In this study found that mothers who do not wash hands properly can increase the risk of 3.9 times a toddler experiencing diarrhea. It is also supported by research from Laksmi in 2013 about the relationship of mother behavior to diarrhea occurrence in toddler in working area of Puskesmas Sukawati I which found that more than 1/3 respondents who did not wash their hands properly, 84,2% have toddlers with diarrhea. The incidence of diarrhea becomes higher when the mother does not wash her hands before feeding her toddler.[14] Research from Pratama in 2013 also mentions that there is a relationship between washing hands with soap before feeding the child with the incidence of

diarrhea in toddlers in Sumurejo Village.[15] While research from Nuraeni found that bad handwashing habits can risk 20,333 times experienced diarrhea incidence.[10] Research conducted by Rohmah has significantly demonstrated the relationship between handwashing and the incidence of diarrhea in infants. In the research obtained respondents who washed hands with soap and did not experience diarrhea of 75.6% while washing hands with soap and diarrhea of 24.4% with a value of p 0.006.[16]

Diarrhea is a disease whose transmission is related to healthy life behavior, and hand is a medium of the influx of disease-causing germs into the human body. The purpose of washing hands with soap and running water is to remove impurities and reduce disease-causing microorganisms. The hands will be free of bacteria when applying the habit of washing hands properly using soap and running water and cleaning all parts of the hand.

The relationship between Healthy Toilet with Diarrhea Occurrence in Under Fives Years Old Toddler at Work Area of Puskesmas I Negara

The use of a healthy latrine or toilet is also one aspect of Clean and healthy lifestyle behavior in the household that affects the incidence of diarrhea. Diarrhea is a disease that is transmitted related to healthy living behavior, and hand is a medium of the influx of germs that cause the State have toilet facilities at home, but the application of CHLB is still less because the majority of respondents only clean the toilet when it looks dirty. Some respondents still use water sources less than 10 meters away from waste disposal sites or septic tanks. Also, many respondents who have a habit of using pampers in toddlers so that waste pampers containing dirt/stool is still disposed of any place, i.e., in the river or open bins. The habit of dumping pamper in the river will contaminate the water while in the open garbage will be infested by many flies that will be a source of infection that is harmful to health.

Based on the univariate analysis results obtained that from 50 respondents, 10 (20%) of them use healthy latrines and the rest are not. The result of the bivariate analysis showed that there was a significant correlation between the use of latrines and the incidence of diarrhea in under-fives with p = 0,002. The results showed the use of unhealthy latrines could cause diarrhea up to 62.5%. The use of unhealthy latrines can be 6.25 times the risk of diarrhea occurrence in infants. The results of this study also supported by research from Nuraeni, 2012 which shows the use of poor latrines can cause diarrhea in infants up to 70%. Use of poor latrines can be risky 11.667 times a toddler experiencing diarrhea. In the study, stool removal that did not meet health requirements could increase incidence in children. If the disposal of human waste is not good then it can contaminate the hands, water, soil or flies and insects can infest the stool so it can cause the spread of various diseases including diarrhea.[10] While the research from Kusumaningrum in 2011 regarding the relationship of the use of healthy latrines with the incidence of diarrhea in toddlers in Kelurahan Gandus Palembang found the result that families who use unhealthy toilets, can be risky 3,043 times a toddler suffering from diarrhea compared to families who use healthy latrines.[9] The use of good latrines is that no stools are left behind (latches) around the toilet, and regularly clean and brush the toilet. While the latrine characteristic is good and can be used by all family members, which is at least 10 meters from the source of water and settlement, the stool disposal at least 1 meter deep, and does not allow flies or insects to settle in the feces stool.[10] Fecal disposal is an important part of health. The spread of infectious bacteria to the environment, especially clean water can be prevented by the use of latrines or healthy toilets.[17]

LIMITATION

This research has several weaknesses, included the toddler age range was very high and were categorized into 5 categories, so there was a possibility of bias. Data collection was done by questionnaire method, so there was a possibility of the respondents have been not seriously filled the questionnaire.

CONCLUSION

From the results of research on the Relationship of Clean and healthy lifestyle behavior of the mother with the incidence of Diarrhea in Toddlers at Puskesmas I Negara in 2017, it can be concluded majority of respondents have a bad clean and healthy lifestyle behavior (CHLB) category and the incidence of diarrhea in toddler tends to be more in mothers with bad clean and healthy lifestyle behavior (CHLB) category.

REFERENCES

1. Dinas Kesehatan Provinsi Bali. Profil Dinas Kesehatan Provinsi Bali. 2016. Available: http://www.diskes.baliprov.go.id/files/subdomain/diskes/Profil%20Kesehatan%20Provinsi%20Bali/Tahun%202015/Bali_Profil_2015.pdf. Accessed: 20 September 2016.
2. Departemen Kesehatan RI. Perilaku Hidup Bersih dan Sehat. Bakti Husada. 2011.
3. Puskesmas 1 Negara. Profil Puskesmas 1 Negara Tahun 2016. Kecematan Negara Kabupaten Jembrana.
4. Sari, Siska A. Hubungan Perilaku Hidup Bersih dan Sehat (PHBS) Ibu dengan Kejadian Diare pada Bayi Usia 1-12 Bulan di Kelurahan Antirogo Kabupaten Jember. Universitas Jember. 2012.

5. Agustina, Yulia M. Hubungan antara Perilaku Hidup Bersih dan Sehat (PHBS) dengan Kejadian Diare pada Balita di Posyandu Dusun Ketangi Desa Banyusoco Kecamatan Playen Kabupaten Gunungkidul Yogyakarta. Sekolah Tinggi Ilmu Kesehatan Aisyah Yogayakarta. 2013.
6. World Health Organization (WHO). Global Water Supply and Sanitation Assesment. Geneva: World Health Organization. 2009.
7. Utari T. Hubungan Perilaku Hidup Bersih dan Sehat dengan Kejadian Diare di Wilayah Kerja Puskesmas Delangau. Jurnal Kesehatan dan Kedokteran Indonesia. 2009. 1:53-61.
8. Subagijo. Hubungan Antara Perilaku Hidup Bersih dan Sehat dengan Kejadian Diare yang Berobat ke Puskesmas Purwokerto Barat. Fakultas Kesehatan Masyarakat. Universitas Diponegoro, Semarang. 2009.
9. Kusumaningrum, Hepriyani, and Nurhalinah. Pengaruh PHBS Tatatnan Rumah Tangga terhadap Diare Balita di Palembang. Universitas Sriwijaya. 2011.
10. Nuraeni, Asti. Hubungan Penerapan PHBS Keluarga dengan Kejadian Diare Balita di Kelurahan Tawangmas Kota Semarang. Universitas Indonesia. Jakarta. 2012.
11. Yulisa. Faktor-Faktor yang Mempengaruhi Diare pada Anak Balita. Fakultas Kesehatan Masyarakat: Universitas Diponegoro. 2008.
12. Apriyanti, Ikob, and Fajar. Faktor-faktor yang Berhubungan dengan Kejadian Diare pada Anak Usia 6-24 bulan di Palembang. Fakultas Ilmu Keperawatan Universitas Sriwijaya. 2009.
13. Sirait E. Hubungan Pengetahuan dan Perilaku Hidup Bersih dan Sehat Ibu dengan Kejadian Diare pada Anak Usia 1-4 tahun di Puskesmas Siantan Hilir Tahun 2013. Fakultas Kedokteran Universitas Indonesia. 2013.
14. Laksmi A, Winsiani T, Hartawan B. Hubungan Perilaku Ibu Terhadap Kejadian Diare Pada Balita di Wilayah Kerja Puskesmas Sukawati I Periode Bulan November Tahun 2013. Bali: Fakultas Kedokteran Universitas Udayana. 2013.
15. Pratama, Riki N. Hubungan antara Sanitasi Lingkungan dan Personal Hygiene Ibu dengan Kejadian Diare pada Balita di Kelurahan Sumurejo Kecamatn Gunungpati Kota Semarang. JKM. 2013. 2 (1).
16. Rohmah N, Syahrul F. Hubungan Cuci Tangan dan Penggunaan Jamban Sehat Dengan Kejadian Diare Pada Balita. Surabaya: Universitas Airlangga. 2017.
17. Tandio, D., Manuaba, A. 2016. Safety Procedure for Biosafety and Controlling a Communicable Disease: Streptococcus Suis. Bali Medical Journal 5(2): 260-262. DOI:10.15562/bmj.v5i2.220