



## Relationship between Clean and Healthy Life Behaviour with Diarrhea in Infants

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### Abstract

**Background:** Diarrhea is one of the environment-based diseases which is the leading cause of death. The occurrence of diarrhea in infants cannot be separated from habits healthy living of each family. These factors include breastfeeding, complementary feeding, the fair use of clean water, the practice of washing hands, using latrines and adequately removing baby's stool water. This study intends to find out the relationship between Clean and Healthy Life Behavior or in Indonesia is known as Prilaku Hidup Bersih dan Sehat (PHBS) which includes the use of clean water, the habit of washing hands with soap and the use of healthy latrines to the incidence of diarrhea in infants in the Baturraden Health Center, Central Java Province, Indonesia.

**Method:** This type of research is observational with inferential analysis design that examines the relationship of cases (disease) with exposure /factors risk indeed. The relationship between variables was obtained through bivariate analysis in research variables with the chi-square processed in the investigation.

**Results:** The results of this study obtained that there is no relationship between sources of clean water used for daily activities with the incidence of diarrhea in infants ( $p$ -value = 0.68: OR = 3.051). There is a correlation between hand washing habits with soap and the prevalence of diarrhea in infants ( $p$ -value= 0.024: OR = 7,000), and there is a relationship between the practice of using latrines with the incidence of diarrhea in infants ( $p$ -value= 0.019: OR = 4.125).

**Conclusion:** this study obtained the relationship between respondents' habits in handwashing with soap to the incidence of diarrhea in infants. There was a correlation between latrine use habits and the prevalence of diarrhea in infants under five in Baturraden Health Center, so it is suggested for the clinic to improve PHBS promotion to the community and further increase the public awareness in PHBS among the family for more knowledge.

**Keyword:** diarrhea, infants, clean water, healthy life.

### Introduction

Diarrhea is one of the environment-based diseases which is a significant cause of illness and death. Based on data from the World Health Organization (WHO), diarrhea ranks fifth in the ten causes of death in the world (WHO, 2011).

The morbidity survey conducted in Indonesia by the sub-district division of diarrhea, from 2000 to 2010 saw a tendency for incidents to rise. In 2000 diarrhea was 301 / per 1000 population, in 2003 increased to 374 / per 1000 people, in 2006 rose to 423 / per 1000 people and in 2010 to 411 / per

1000 people. In 2008 an outbreak occurred in 69 sub-districts with 8133 cases, 239 deaths, in 2009 an explosion occurred in 24 districts with a total of 5,756 cases, with 100 deaths, whereas in 2010 there were outbreaks of diarrhea in 33 sub-districts with 4204 patients with 73 deaths (Kemenkes RI, 2011).

According to data obtained from the Banyumas District Health Office, the number of diarrheal disease cases in 2012-2013 contained 42467 instances with details in 2012 there were 21251 cases, and in 2013 there were 21216 cases. Diarrhea in the Baturraden District occupies the highest position in the region of Banyumas Regency, with a prevalence rate of 4.90%. In detail, 863 cases were found in the Baturraden Community Health Center I area, and 606 examples were located in the Baturraden Community Health Center II work area.

In 2014, Baturraden Sub-district found 188 cases of diarrhea in toddlers, with as many as 137 cases found in the Baturraden Community Health Center I work area and 51 cases were located in the Baturraden Puskesmas II work area. The work area of Puskesmas I Baturraden is the Puskesmas area which has the highest diarrhea cases, namely 137 cases. The working area of Puskesmas I Baturraden covers six sub-district namely Purwosari, Kutosari, Pamijen, Kebumen, Karang Tengah, and Ketenger.

The cause of diarrhea in infants cannot be separated from habits healthy living of each family. These factors include breastfeeding, complementary feeding, the fair use of clean water, the practice of washing hands, using latrines and adequately removing baby's stool water. All of these contribute significantly to the health of the family environment. In infants under five, diarrhea is influenced by the body's immunity, parenting, environmental hygiene and the behavior of mothers or caregivers of toddlers (Widjaja,2001).

This study intends to determine the relationship between PHBS which includes the use of clean water, the habit of washing hands with soap and

the use of healthy latrines to the incidence of diarrhea in infants in the Baturraden 1 Puskesmas working area.

### Methods

This type of research is observational with analysis inferential design *Case Control*. This is an epidemiology observational analytic study that examines the relationship of cases (disease) with exposure /factors risk indeed. The study begins by identifying groups with disease (cases) with groups without cases (controls), then retrospectively (backward search) risk factors that may explain whether cases and controls are due to exposure or not.

The sample of this study was toddlers with diarrhea cases in the work area of Baturraden Community Health Center I and control were chosen the closest neighbors with toddlers with similar ages. The data obtained were then analyzed in univariate to find out the distribution of PHBS in the community and the incidence of diarrhea in infants. The relationship between variables is known through bivariate analysis with the formula of *chi-square*.

### Results

This study aimed to determine the relationship between Clean and Healthy Life Behavior with the incidence of diarrhea in infants under five in the Kebumen Village of the Baturraden Health Center I in 2015. The number of study respondents was 60 people. In 2014 the percentage of families according to the source of drinking water used in the Baturraden Health Center I working area which consisted of refill water, pump plumbing, protected wells, protected springs, unprotected wells, unprotected springs, and others. The number of families examined by 5,665 households. The percentage of families with safe drinking water sources was 2,982 (52.6%). In the same year, it was shown that in 2014 the percentage of ownership of healthy latrines in the Baturraden Community Health Center I working area from the number of families examined was

5741 households (75.4%), the number of families with restrooms was 3769 families (65.7%) and the number of families with healthy toilets as many as 2875 families (76.3).

Based on observations, showed that respondents who used clean water for daily activities that did not meet the requirements. In the case group were 17 respondents (56.7%) and in the control group there were 9 respondents (30.0%) while respondents who used clean water for activities daily that meet the requirements in the control group there are 21 respondents (70.0%) and in the case group there are 13 respondents (43.3%). In addition, respondents who did not get used to washing their hands using soap after defecation in the case group were 10 respondents (33.3%) and in the control group there were 2 respondents (6.7%) while hand washing habits used soap after defecation in the case group there were 20 respondents (66.7) and in the control group there were 28 respondents (93.3%). Observations also showed that respondents who did not get used to using the latrine during defecation in the case group were 18 respondents (60.0%) and in the control group there were 8 respondents (26.7%) while respondents who used the toilet when defecating in the control group there were 22 respondents (73.3%) and in the case group there were 12 respondents (40.0%).

The source of clean water used for daily activities that do not meet the requirements of the case group is a higher proportion of 56.7% compared to the control group of 30.0% while the source of clean water used for daily activities that meet the requirements of the control group is of a higher proportion 70.0% compared to the case group 43.3%. The results of the chi-square test showed the value of *P-Value*-0.68 thus the amount of *P-value* is greater than 0.5. There was no significant relationship between the source of water used for daily activities with the incidence of diarrhea in infants. The odd testing ratio shows OR value: 3.051 means that respondents whose sources of clean water used for daily activities do not meet the requirements have a risk of developing

diarrheal disease with 3,051 greater than respondents whose sources of fresh water used for daily activities meet the requirements.

The habit of respondents not washing their hands using soap after defecation in the case group was the higher proportion of 33.3% compared to the control group 6.7%, while the habit of respondents was washing their hands using soap after defecation control group proportion more 93.3% compared to the 66.7% case group. The results of the test *chi-square* showed the *P-value* of 0.024 thus the *P-Value value* is small: 0.5, it was stated that there was a significant relationship between the habit of washing hands using soap after defecation with the incidence of diarrhea in infants, testing. *Odds ratio* showed OR: 7,000 meaning that respondents who did not get used to washing their hands using soap after defecating had a risk of getting diarrhea 7,000 times greater than respondents who were accustomed to wash their hands using soap after defecation. The habit of not using toilets during defecation in the case group was a proportion of 60.0% greater than the control group 26.7%, while the practice of using latrines when defecating was greater proportion control group 73.3 % compared to the 40.0% case group. The results test *chi-square* show the value of *P-value* 0.019 thus the value of *P-value* less than 0.5. There's a significant correlation between the habit of using the toilet with diarrhea in young infants, and the test *odds ratio* showed the value OR: 4.125 means that respondents not getting used to using latrines when defecating has a risk of getting diarrhea 4.125 times greater than respondents who get used to using restrooms when defecating.

### Discussion

The results of the data analysis showed that the source of clean water used daily had no significant relationship with the incidence of diarrhea in infants under five in the village of Kebumen the work area of Baturraden Health Center, where the test *chi-square* showed a *p-value* of 0.068 thus the *P-value* was more size of 0.5. From the

observations in the field, the water sources used by the respondents for their daily activities are still classified as not meeting the health requirements because most respondents still use the clean water source from the river for their daily activities. The river used by the respondents came from the Banjaran river where the river was used for various activities such as toilet washing, and the river was also used as a final sewer for household waste.

This study is not in line with Widoyono (2012), about the relationship between the adoption of a family's clean and healthy lifestyle with the incidence of diarrhea in infants under five in the urban village of Tawangmas Semarang, which showed a significant relationship between family's clean water source and prevalence of diarrhea in infants with *P-value* 0,00 and OR 10.311.

According to Matthai (2011), transmission of infectious germs that cause diarrhea are transmitted through *fecal-oral*. The bacteria can be spread if it enters the mouth through food, drinks or objects that are contaminated with feces, such as the fingers, food that is in the container or where food-drinks are washed with polluted water. Communities that are affordable by the provision of clean water have a smaller risk of suffering from diarrhea compared to people who do not get clean water. The community can reduce the risk of diarrhea attacks by using clean water and protecting clean water and protecting the water from contamination from the source to storage at home.

Efforts that must be done by the community to prevent the occurrence of diarrhea in infants are by using clean water facilities. The source of water used daily is confirmed to come from a fresh water source. Storage of water in a clean and closed place and using a dipper to collect water. The fresh water used must be protected from pollution by animals. The drinking needs handling by the family must be boiled and washed all the cooking utensils and utensils with clean and sufficient water.

For people who still use river water as a source of clean water, it is better to replace the water source by making a borehole or dug well that meets health requirements. For people who are not economically able to make drilled wells still use river water sources for bath, wash, toilet, it is better if the water from the river is not directly used but firstly processed by filtering and then accommodated in a reservoir. The treatment is carried out like (neutralize with limestone/aeration, aeration, coagulation with alum, sedimentation, and filtration).

The results of the data analysis showed that there was a significant relationship between the habit of hand washing using soap and the incidence of diarrhea in infants under five in the village of Kebumen I Batturraden I Community Health Center where the results of the chi-square test showed a *p-value* of 0.024 thus the *p-value* is smaller than 0,5. Based on observations in the field respondents who did not get used to washing their hands after defecation the case group had a higher proportion of 33.3% compared to the control group 6.7%.

This study is in line with Kamin (2012), which showed a significant relationship between hand washing habits and the incidence of diarrhea in infants. The results of the chi-square test showed *p-value* 0.000 and OR 20,333. This is because the hands will be free of bacteria when washing hands using soap and running water and cleaning all parts of the side.

According to Cammileri (2017), hand washing with soap is an essential behavior for efforts to prevent diarrhea, the habit of hand washing is applied after defecation, after handling child stools, before eating or feeding infants and before preparing food. High diarrhea can be caused by fingers or hands that contaminate food in cooking meals. This is because the hand is one of the media for the entry of germs that cause disease into the body. Thus if a person is accustomed to washing hands, especially at critical times, it can minimize the entry of bacteria through the hands.

Diarrhea is one of the diseases that are related to healthy behavior. In this transmission, the hand plays an important role, because through unclean hands food or drinks are contaminated with germs entering the human body. Hands are the primary carriers of microorganisms that come from feces. The role of the hand on the spread of germs is very dominant, so that if the position of the hand can be controlled automatically prevent the occurrence of diarrhea. The purpose of washing hands with soap is to remove dirt and dust that is attached to the surface of the skin and reduce the number of microorganisms temporary. The behavior of hand washing with soap in the right way and at the right times is very important in controlling the incidence of diarrhea (Schiller, 2017).

For people who are not accustomed to washing their hands using soap after defecation should train themselves to get used to washing hands using soap after defecation the high diarrheal disease caused by fingers or hands because the hand is the primary carrier microorganism that comes from feces. Judging from the results of the study which showed a significant relationship between hand washing using soap and the incidence of diarrhea in infants, it is expected that the Community Health Center or in Indonesia is known as *Pusat Kesehatan Masyarakat (Puskesmas)* conduct counseling to change community behavior through integrated health service post or in Indonesia is known as *Posyandu* that people know and understand the importance of hand washing using soap after defecation.

There was a significant relationship with the incidence of diarrhea in toddlers in the village of Kebumen I Baturraden Health Center working area in 2015 where the test *chi-square* showed *p-value* 0.019 thus *p-value* smaller than 0.05. The habit of not using latrines when defecating the proportion of case groups was 60.0% greater than the control group 26.7%. Respondents who did not get used to using latrines during defecation were at a risk of 4,125 times more affected by

diarrhea compared to respondents who used to use restrooms when defecating.

This study is in line with Roberson (2017), which showed no significant relationship between the use of latrines with the incidence of diarrhea in infants with *PValue*-0,000 and 11.667. In this study, the similarity is that for the disposal of feces most of the respondents still do not meet the requirements of again throwing feces in ponds and rivers. Fecal disposal that does not meet health requirements can increase the incidence of diarrhea in infants. If the disposal of human waste is not suitable, it can contaminate the hands, water, soil or can stick to flies and insects that come into the stool so that it can cause transmission of diseases including diarrhea.

People still underestimate the making of latrines and septic tanks that meet health requirements, so many people already have a closet but do not have a septic tank, it can happen because people do not know about the dangers of fresh stools that are not appropriately handled will cause disease transmission, because feces can be a source of diarrheal disease. According to Widoyono (2008), most diarrhea (75%) is caused by germs such as viruses and bacteria. Stools that have been infected contain viruses or bacteria if the feces are infested with flies and then the flies land on food, then the food can transmit diarrhea to people who eat these foods.

The solution is for respondents who are not accustomed to using toilets when defecating to immediately train their toddlers to get used to using toilets during defecation. For the community health centers to conduct counseling on the importance of PHBS. Like using a toilet for defecation, because open defecation can pollute the environment (water, soil, etc.) and cross contamination is possible. Cross-contamination occurs because flies perch on human waste and then enter food, and humans eat the food, so there is fear of cross-contamination.

## Conclusion

In the case group to use clean water for activities

daily, the most did not meet the requirements (56.7%) and the control group to use fresh water for daily activities met the most requirements (70.0%). For the case group, the habit of not washing hands using soap after defecation did not meet the criteria at most (33.3%) and the control group who used to wash their hands using soap after defecating most often met the conditions (93, 3%). For case groups, the habit of not using latrines when defecating at most do not meet the requirements (60.0%) and in the control group who are accustomed to using toilets when defecating most fulfills the requirements (73.3 %). There is no relationship between sources of clean water used for daily activities with the incidence of diarrhea in infants under five. There is a relationship between hand washing habits with soap and the prevalence of diarrhea in infants. There is a relationship between the practice of using latrines with the incidence of diarrhea in infants.

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