

RELATIONSHIP BETWEEN PERSONAL HYGIENE, TOILET CONDITIONS OF FAMILY AND THE INFORMATION RECEIVED WITH THE INCIDENCE OF TYPHOID FEVER IN PUSKESMAS NOGOSARI BOYOLALI

Agung Triono¹, Heru Subaris Kasdjono², Anisa Catur Wijayanti¹

Public Health Department, Health Science Faculty, Muhamadiyah Surakarta University¹

Poltekkes Kemenkes Yogyakarta²

e-mail : anisacaturwijayanti@gmail.com

Abstract

Typhoid fever is a disease caused by infection with the bacterium *Salmonella typhi*, the disease is still a public health problem, especially in developing countries. The purpose of this study was to analyze the relationship between personal hygiene, conditions of household toilets and information received with the incidence of typhoid fever in Puskesmas Nogosari Boyolali.

This type of research is observational research with case control design. Population of cases in this study were all patients with typhoid fever in January-December 2014, while population control is not the typhoid fever patients. Selection of the sample in the case group of 35 people and control as many as 35 people were done using Fixed Disease Sampling techniques while using a Chi Square test.

Results of this study indicate that there is a relationship between the habit of washing hands after defecation ($p = 0.008$; OR = 3.750; 95% CI = 1.383 to 10.169), the habit of washing hands before eating ($p = 0.030$; OR = 2.909; 95% CI = 1.093 to 7.739), eating habits outside the home ($p = 0.039$; OR = 3.000; 95% CI = 1.034 to 8.702), the received information with the incidence of typhoid fever ($p = 0.007$; OR = 4.008; 95% CI = 1.428 to 11.247) and there is no relationship between the habit of washing raw food that will be eaten immediately ($p = 0.225$), family latrine condition (0.220) with the incidence of typhoid fever in Puskesmas Nogosari Boyolali.

Keywords : Personal hygiene, toilet condition, Information, Typhoid Fever

A. Introduction

Typhoid fever is an acute infection of the digestive tract caused by *Salmonella typhi*. According to the World Health Organization (WHO) in 2000 there were 21.5 million cases of typhoid fever world wide, 200,000 of them died of the disease with the Case Fatality Rate (CFR) 0.9%. Based on the WHO report in 2003 there were approximately 17 million cases of typhoid fever 600,000 of them die every year (WHO, 2003). In 2014 an estimated 21 million cases of typhoid fever 200,000 of them die each year world wide (WHO, 2014).

Typhoid fever is an endemic disease in Indonesia. Data in 2010 showed that cases of typhoid fever was ranked three of the ten types of illness in hospitalized patients in hospitals

through out Indonesia. Total cases of typhoid fever reached 41.081 people composed of 19.706 men, 21.375 women and 274 patient shave died. Case fatality rate (CFR) of typhoid fever in 2010 amounted to 0.67% (Ministry of Health RI, 2011). Based on the Report of the Basic Health Research (2008), in the province of Central Java in 2007 patients with typhoid fever there is a prevalence of 1.6%, and scattered through out the County/City with a range of 0.2 to 3.5%. The highest prevalence of typhoid reported from Wonosobo and Pemasang by 3%.

Based on data from the Integrated Surveillance-Based Health Center (New Cases) in Boyolali Health Service (2013), in Boyolali incidence of typhoid fever of 828 cases (0.8%) per 100,000 population (Boyolali Health Service, 2013).

Based on data from typhoid fever of Puskesmas Nogosari Boyolali (2014), known to a rise in cases of typhoid fever in 2011 there were 179 cases (0.3%), in 2012 there were 309 cases (0.5%), in 2013 there were 410 cases (0.7%) and in 2014 there were cases of as many as 231 cases (0.4%).

Based on the preliminary survey conducted in Puskesmas Nogosari the result that the condition of the toilet facilities that are eligible for 60%, the habit of washing hands with soap before eating 40%, the habit of eating outside the home 70%, the habit of washing hands with soap after defecation by 30%, the habit of washing raw food that will be eaten immediately by 40%, received information about typhoid fever by 20% and has never been a study of typhoid fever in the working area of Puskesmas Nogosari. Based on the above problems researchers interested in conducting research on "The Relationship Between Personal hygiene, Family Lavatori Conditions and Information Received With the Incident of Typhoid Fever in Puskesmas Nogosari Boyolali". The purpose of this study was to determine the relationship between personal hygiene, family lavatory condition and information received with the incidence of typhoid fever in Puskesmas Nogosari Boyolali.

B. Methods

This study uses an observational research study type the case-control approach that is analytical research (Notoatmodjo, 2010). This study research subjects into two groups, namely the case and control groups. The study was conducted in May-June 2015 in Puskesmas Nogosari Boyolali with District of the Village are Ketitang, Guliand Tegal Giri. The population in this study are all the people in Puskesmas Nogosari Boyolali. The sample in this study are obtained a sample of 35 respondents. At the controls of the group amounted to 35 and the case group totaled 35, bringing the total of all respondents be numbered 70 respondents. Sampling technique used in this research is by using Fixed Disease Sampling (Gerstmanin Murti, 2013).

Bivariate analysis is used to determine the relationship between each independent variable

in personal hygiene, conditions of latrines, the information received, the dependent variable is a incidence of typhoid fever and to know the results of OR by statistical test Chi-Square. Data was analyzed using computer software with a significant level $\alpha=0.05$ (95% confidence level).

C. Results and Disscution

a. Respondents Characteristics

1. Respondents Age

Based on Table 1, note that the average age in the cases group, namely 39.06 ± 22.21 and the average age in the control group, which is 38.86 ± 16.78 .

2. Respondents Gender

Distribution characteristics of respondents by sex for cases and controls most female. In the case of groups of as many as 23 people (65.7%), and the control group as many as 18 people (51.5%).

3. Respondents Education

Distribution characteristics of respondents based education for elementary school groups most cases as many as 11 people (31.4%) and in the control group most junior high school graduation as many as 15 people (42.9%).

b. Analysis Bivariat

1. The relationship between the habit of washing hands after defecation With the Incident of Typhoid Fever

Based on the results of Chi Square test in table 4, it is known that there is a relationship between the habit of washing their hands after defecation with the incidence of typhoid fever ($p = 0.008$), with a value of Phi Cramer's V is 0,316 which showed that the level of closeness of the relationship between independent variables and weakly dependent variable (0.200 to 0.399). Value OR = 3.750 (95% CI = 1.383 to 10.169) so that it can be interpreted that a person who does the habit of washing hands after defecation unfavorable risk by 4 times to experiencethe incident of typhoid fever.

2. The relationship between Hand Wash Before Eating Habits With the incidentof Typhoid Fever

Based on the results of Chi Square test in table 4, it is known that there is a relationship between the habit of washing hands before eating with the incidence of typhoid fever ($p = 0.030$), with a value of Phi Cramer's V is 0.259 which indicates that the degree of closeness of the relationship between independent variables and the dependent variable are weak (0.200 to 0.399). Value OR = 2.909 (95% CI = 1.093 to 7.739) so it can be interpreted that the person who does the habit of washing hands before eating unfavorable risk for 3 times to experience the incident of typhoid fever.

3. The relationship between habits Eating out Home With the incident of Typhoid Fever

Based on the results of Chi Square test in table 4, it is known that there is a relationship between eating habits outside the home with the incidence of typhoid fever ($p = 0.039$), with a value of Phi Cramer's V is 0.246 which indicates that the degree of closeness of the relationship between independent variables and the dependent variable are weak (0.200 to 0.399). Value OR = 3.000 (95% CI = 1.034 to 8.702) so it can be interpreted that the person

doing the eating habits outside the home at risk for 3 times to experience the incident of typhoid fever.

4. The relationship between Raw Material Washing Habits That Will eat Directly With the incident of Typhoid Fever

Based on the Chi Square test results in table 4, it is known that there is no relationship between the habit of washing raw food that will be eaten directly with the incidence of typhoid fever ($p = 0.225$). Respondents who make a habit of washing raw food that will be eaten directly with both categories of case group and control more than doing the habit of washing raw food that will be eaten directly with unfavorable category.

5. The relationship between Family Latrine condition with the incident of Typhoid Fever

Based on the Chi Square test results in table 4, it is known that there is no correlation between the condition of the family latrine with the incidence of typhoid fever ($p = 0.220$). Respondents with family latrine conditions that qualify the case group and the control over much of the family latrine conditions that do not qualify.

Table 1. Descriptive Statistics calculation Average Age Group

Group	N	Minimum	Maksimum	Mean	SD
Cases	35	4	79	39,06	22,21
Control	35	17	77	38,86	16,78

Table 2. Frequency Distribution of Respondents by Gender

Gender	Cases		Control	
	(n)	(%)	(n)	(%)
Male	12	34,3	17	48,6
Female	23	65,7	18	51,4
Total	35	100	35	100

Table 3. Frequency Distribution of Respondents According to Education

Education	Cases		Control	
	(n)	(%)	(n)	(%)
Yet School	2	5,7	0	0
No School	7	20	4	11,4
Elementary School	11	31,4	7	20
Junior High School	9	25,7	15	42,9
Senior High School	4	11,4	7	20
College	2	5,7	2	3,7
Total	35	100	35	100

6. Relationship between the information received with the incident of Typhoid Fever
Based on the results of Chi Square test in table 4, it is known that there is a relationship between the information received by the incidence of typhoid fever ($p = 0.007$), with a value of Phi Cramer's V is 0.323 which indicates that the degree of closeness of the relationship between independent variables and the dependent variable are weak (0.200 to 0.399). Value OR = 4.008 (95% CI = 1428-11247) so it can be interpreted that a person who does not get information about the risk of typhoid fever by 4 times to experience the incidence of typhoid fever.

a. Relationship Between the habit of washing hands after defecation with the incident of Typhoid Fever

Based on the results of statistical analysis concluded that there is a relationship between the habit of washing their hands after defecation with the incidence of typhoid fever in the region of Puskesmas Nogosari ($p = 0.008 < 0.05$). Value Phi Cramer's V is 0,316 which showed that the level of closeness of the relationship between independent variables and the dependent variable is weak (0.200 to 0.399). OR values were obtained in the amount of 3.750 (95% CI = 1.383 to 10.169) so that it can be interpreted that someone hand washing after defecation with unfavorable category 4 times the risk of experiencing incidence of typhoid fever. According Fathonah (2005), declare that dirty or contaminated hands can transfer bacteria or viral pathogens from the body, stool or any other source to the food. Therefore hand hygiene by washing hands should receive high priority, although it is often overlooked washing with

Table 4. Results of Analysis Variables Bivariate relationship with the incident of Typhoid Fever in Puskesmas Nogosari Boyolali 2015

Variable	Cases		Control		P Value	Phi Cramer's V	OR	95%CI
	(n)	(%)	(n)	(%)				
The Habit of Washing Hands after Defecation								
Not Good	25	71,4	14	40	0,008	0,316	3,750	1,383-10,169
Good	10	28,6	21	60				
Total	35	100	35	100				
The Habits Hand Wash Before Eating								
Not Good	24	68,6	15	42,9	0,030	0,259	2,909	1,093-7,739
Good	11	31,4	20	57,1				
Total	35	100	35	100				
The Habits Eating out Home								
Yes	15	42,9	7	20	0,039	0,246	3,000	1,034-8,702
No	20	57,1	28	80				
Total	35	100	35	100				
Raw Material Washing Habits that Will Eat Directly								
Not Good	24	68,6	15	42,9	0,225	0,145	1,810	0,691-4,740
Good	11	31,4	20	57,1				
Total	35	100	35	100				
Kondisi Jamban Keluarga								
Not Qualify	16	45,7	11	31,4	0,220	0,147	1,837	0,693-4,873
Qualify	19	54,3	24	68,6				
Total	35	100	35	100				
Information Received								
No	27	77,1	16	45,7	0,007	0,323	4,008	1,428-11,247
Yes	8	22,9	19	54,3				
Total	35	100	35	100				

soap as a cleanser, rubbing and rinsing with running water will wash away dirt particles which contains microorganisms.

According to the theory advanced by Arisman (2008), that the culture of proper hand washing is the most important activity. Each hand is used to hold food, the hands must be clean. Hands need to be washed because of the thousands of microorganisms, both normal flora or contamination, the sticking place and easily switch to food untouched. Washing correctly has proven successful to reduce the incidence of contamination and outbreaks.

Health efforts should be made that the provision of knowledge or information to the public in a way to educate the public about the importance of hygienic behavior and healthy especially personal hygiene which aims to enable communities to carry out personal hygiene includes washing hands properly in order to prevent the occurrence of fever and to enable the health center to activate PHBS program so as to reduce the incidence of typhoid fever as low as possible. We know that personal hygiene includes washing hands after defecation is one of the factors the occurrence of typhoid fever that personal hygiene should be done well, toxicity Proper hand washing must be cultivated because one transmission of *Salmonella typhi* bacteria through the fingers or nails.

Each hand is used to hold food, then it must have clean hands, the hands need to be washed because of the thousands of microorganisms, both normal flora or contamination, the sticking place and easily switch to food untouched. Washing correctly has proven successful to reduce the incidence of contamination and outbreaks (Arisman, 2008).

How to perform proper hand according Proverawati and Rahmawati (2012), is as follows:

1. Wash your hands with running water and use soap. No need to be a special antibacterial soap, but preferably liquid soap.
2. Rub hands for at least 15-20 seconds.
3. Clean the wrist, back of hands, between fingers and fingernails.
4. Rinse hands well under running water.
5. Dry with a clean towel or other dryer.

6. Use a tissue/towel as a barrier when turning off the water tap.

b. Relationship Between Eating Habits Wash Hands Before with the incident of Typhoid Fever

Based on the test results of statistical analysis concluded that there is a relationship between the habit of washing hands before eating with the incidence of typhoid fever in the region of Puskesmas Nogosari ($p = 0.030 < 0.05$). Value Phi Cramer's V is 0.259 which indicates that the degree of closeness of the relationship between independent variables and the dependent variable is weak (0.200 to 0.399). OR values were obtained in the amount of 2.909 (95% CI = 1.093 to 7.739) so it can be interpreted that a person whose habit of washing hands before meals with unfavorable category 3 times the risk of experiencing incidence of typhoid fever.

c. Relationship between Eating Habits Outside the house with the incident of Typhoid Fever

Based on the results of statistical analysis concluded that there is a relationship between eating habits outside the home with the incidence of typhoid fever in the region of Puskesmas Nogosari ($p = 0.039 < 0.05$). Value Phi Cramer's V is 0.246 which indicates that the degree of closeness of the relationship between independent variables and the dependent variable is weak (0.200 to 0.399). OR value obtained is equal to 3,000 (95% CI = 1.034 to 8.702) so it can be interpreted that someone who ate three times outside the home at risk of experiencing incidence of typhoid fever.

According Addin (2009), which states that the transmission of typhoid fever can happen anywhere and anytime, usually occurs through the consumption of food outside the home or in public places, if food or beverages consumed less clean. Can also be caused by food that is served by a typhoid patient less to maintain cleanliness while cooking. Can also be caused by food that is served by a typhoid patient latent (hidden) less maintain cleanliness while cooking. A person can carry the germs of typhoid in the digestive tract without pain, this is called latent patients. Patients can transmit typhus disease is to many

people, especially if he works in serving food for many people as a cook in a restaurant.

Health measures that must be done is to provide knowledge to the community by way of outreach to the community about controlling the incidence of typhoid fever. One that is not used to eating at food stalls are less assured of cleanliness and provide counseling to traders in order to always maintain the cleanliness of the merchandise. Both of washing tools, materials and through the provision of food,

d. The relationship between Raw Material Washing Habits That Will eaten Direct with the incident of Typhoid Fever

Based on the results of statistical analysis concluded that there was no relationship between the habit of washing of food to be eaten directly with the incidence of typhoid fever in the region of Puskesmas Nogosari ($p = 0.225 > 0.05$).

From the results of the study most of the respondents in the control group had the habit of washing raw food that will be eaten directly with both categories as many as 23 people (65.7%), while in the case group as many as 18 people (51.4%). This causes the habit of washing raw food that will be eaten directly in this study is not a risk factor for the incidence of typhoid fever in Puskesmas Nogosari Boyolali.

e. The relationship between the Family Lavatory condition with the incident of Typhoid Fever

Based on the results of statistical analysis concluded that there was no relationship between the Family Lavatori condition with incidence of typhoid fever in the region of Puskesmas Nogosari ($p = 0.220 > 0.05$).

Based on the results of research in the field most of the respondents who have qualified latrine condition contained in the control group as many as 24 people (58.6%) and who do not qualify as many as 11 people (31.4%). Whereas in the case group as many as 19 people (54.3%), this causes the conditions of family latrines in this study is not a risk factor for the incidence of typhoid fever in Puskesmas Nogosari Boyolali.

f. The relationship between the information received with the incident of Typhoid Fever

Based on the results of statistical analysis concluded that there is a relationship between information received with the incidence of typhoid fever in the region of Puskesmas Nogosari ($p = 0.007 < 0.05$). With the value of Phi Cramer's V is 0.323 which indicates that the degree of closeness of the relationship between independent variables and the dependent variable is weak (0.200 to 0.399). OR values were obtained in the amount of 4.008 (95% CI = 1.428 to 11.247) so that it can be interpreted that a person who does not get information about 4 times the risk of typhoid fever experiencing incidence of typhoid fever.

In this research, it is known that the number of respondents who received information about typhoid fever greater in the control group compared with the group of cases, where as in the control group as many as 19 people (54.3%) of which 2 (5.7%) of the book, 3 people (8.6%) from a neighbor, 1 (2.9%) from the gathering of mothers and 13 persons (37.1%) of health care workers. Whereas in the case of group 8 (22.9%) of which 2 (5.7%) from a neighbor, and 6 (17.1%) of health care workers

Information is one very important factor in preventing the incidence of typhoid fever, someone who never get information about typhoid fever, so they never know how to prevent the occurrence of typhoid fever so that they are susceptible incidence of typhoid fever. According Timmreck (2003), a person who has a high level of knowledge will be oriented on the preventive action or can be said to be more aware of health issues and have a good health status. Efforts need to do is to provide information and knowledge to the community by way of extension to all the good people suffering from typhoid fever and are not suffering from typhoid fever, so that the whole community can control typhoid fever incident.

D. Conclusions

1. There is a relationship between the habit of washing their hands after defecation with the incidence of typhoid fever ($p = 0.008$; OR = 3.750; 95% CI = 1.383 to 10.169).
2. There is a relationship between the habit of washing before eating with the incidence of

typhoid fever ($p = 0.030$; $OR = 2.909$; 95% $CI = 1.093$ to 7.739).

3. There is a relationship between eating habits outside the home with the incidence of typhoid fever ($p = 0.039$; $OR = 3.000$; 95% $CI = 1.034$ to 8.702).
4. No association between the habit of washing raw food that will be eaten directly with the incidence of typhoid fever ($p = 0.225$).
5. There is a relationship between the condition of the family latrine with the incidence of typhoid fever ($p = 0.220$).
6. There is a relationship between the information received with the incidence of typhoid fever ($p = 0.007$; $OR = 4.008$; 95% $CI = 1.428$ to 11.247).

Recommendation

1. For the Community
For the community in order to increase individual hygiene especially with good hand washing habits and creating good environmental sanitation so as to carry out prevention and eradication of typhoid fever in the community.
2. In particular, the health center for PuskesmasNogosari
Health workers are expected to continue to provide promotive and preventive one of them may be counseling to all people either suffering or not suffering from typhoid fever in order to control typhoid fever and to provide education to the community, especially in the food trade in order to keep it clean so that the transmission of typhoid fever can be prevented. As well as to improve knowledge and information about typhoid fever is expected to improve personal hygiene and environmental sanitation to reduce the risk of transmission of typhoid fever.
3. For other researchers
Researchers further in order to carry out further research on other factors such as (knowledge, attitude, action, diet, clean water source, family history of typhoid and individual characteristics) associated with the incidence of typhoid fever.

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