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Analysis of the Relationship between Clean Living Behavior and Environmental Sanitation in Thyfoid Patients

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Abstract

Typhoid fever is often experienced by children and teenagers. This happens because they do not realize the importance of food and environmental cleanliness. Typhoid fever is related to the patient's environment and behavior. Prevention of typhoid disease must be linked to clean and healthy living habits such as maintaining a hygienic diet and a clean and comfortable environment, especially for children who do not pay attention to cleanliness and health. The aim of this research is to analyze the relationship between clean living behavior and environmental sanitation in Thyphoid patients at DR Pirngadi Regional Hospital, Medan. This type of research is an analytical survey with a cross-sectional design. The population in this study were typhoid patients at DR Pirngadi Medan Hospital in 2023 for the period January 2023 – September 2023, totaling 585 patients. Determining the sample used interpretive estimation with Structural Equation Modeling (SEM) where the number of samples in this study was 150 samples. Data analysis in this study used univariate, bivariate and multivariate analysis. The results of the research show that there is a relationship between clean living behavior in Thyphoid patients at DR Pirngadi Hospital, Medan, p - value < 0.05, there is a relationship between environmental sanitation in Thyphoid patients at DR Pirngadi Hospital, Medan, p - value < 0.05, simultaneously There is a relationship between clean living behavior and environmental sanitation in Thyphoid patients at DR Pirngadi Hospital, Medan, p - value < 0.05.

Introduction

A high level of health causes the body to be in prime condition so that all the body's organs can function as they should without experiencing significant disturbances which could risk reducing a person's physiological and psychological condition and could hinder work. However, the emergence of a disease is the biggest threat that risks reducing the health status of people in this world (Gunawan et al., 2022).

One of them is the incidence of typhoid fever. Typhoid fever in Indonesia is an infectious disease that can claim a large number of lives. Typhoid fever is often experienced by children and teenagers. This happens because they do not realize the importance of food and environmental cleanliness. Apart from that, child sufferers generally do not have perfect immunity against infections. Transmission of typhoid fever can occur due to the presence of vector and reservoir intermediary animals, snacking habits, unclean food management, as well as personal hygiene behavior that does not meet the requirements, environmental sanitation is not good and clean living behavior is still lacking (Suprapto, 2022).

The main cause in endemic areas of typhoid fever is contaminated water, while in non-endemic areas it is caused by food contaminated with Salmonella typhi bacteria. Transmission of typhoid fever is via fecal-oral, which means that transmission originates from Salmonella typhi bacteria originating from the feces and urine of sufferers or disease-carrying carriers who are not sick and enter the body through food or drink contaminated with Salmonella typhi bacteria. Vectors such as flies really like to land in dirty and dirty places or objects which can become a nest for Salmonella typhi bacteria. Flies landing in dirty and dirty places carry Salmonella typhi bacteria and then land on food, causing contamination of the food (Putri, 2018) .

WHO (World Health Organization) data estimates that the worldwide incidence rate is around 21 million per year with 200,000 people dying from typhoid fever and 70% of deaths occurring in Asia. In Indonesia itself, this disease is endemic. Patients with typhoid fever in Indonesia were recorded at 81.7 per 100,000, in North Sumatra cases of typhoid fever in 2009 were reported at 0.2-3.3% and the highest percentage was reported from South Nias (3.3%). Meanwhile, the percentage for the city of Medan is 0.4%.

Based on the Indonesian Health Profile in 2018, 41,081 cases of typhoid fever were hospitalized and 279 of them died (Kemenkes, 2018). The average incidence of typhoid fever in Indonesia reaches 500/100,000 population with a mortality rate of between 0.6-5%. Based on Basic Health Research (RISKESDAS) conducted by the health department in 2018, the prevalence of typhoid fever in Indonesia reached 1.7%. The highest prevalence distribution is at ages 5-14 years (1.9%), ages 1-4 years (1.6%), ages 15-24 years (1.5%) and ages < 1 year (0.8 %). This condition shows that children aged 0-19 years are the largest population of typhoid sufferers in Indonesia (Riskesdas, 2018).

Typhoid fever is an acute intestinal disease caused by the bacteria Salmonella typhi or Salmonella paratyphi A, B and C. The characteristics of typhoid fever sufferers in children and adolescents are often based on various types, namely age, gender, duration with fever, level of fever, the most common Widal test results, Giving antibiotics and their characteristics (Mustofa et al., 2020).

This disease is closely related to the environment, especially an environment that does not meet health requirements as well as poor personal hygiene as well as inappropriate individual behavior, such as the habit of not washing hands before eating, not washing hands after defecating, the habit of consuming meat products and vegetables that are unhealthy. not ripe, consuming fruit that has not been washed with water, drinking water that has not been boiled, environmental sanitation that is not good, using unclean eating and drinking utensils are behaviors that carry the risk of being infected with Salmonella typhi germs and thus contracting typhoid fever (Gunawan et al., 2022).

According to research by Putri (2018), there is a relationship between environmental sanitation and the incidence of typhoid fever. Sanitation concerns cleanliness in terms of maintaining or maintaining it with clean and simple activities that have an impact on society.

Typhoid fever is related to the patient's environment and behavior. Research in India states that washing hands without using soap, personal hygiene, illiteracy are risk factors for typhoid fever. Factors such as crowded housing, poor sanitation, unhealthy drinking water, and unhealthy food production and serving processes contribute to the spread of S. typhi. A comprehensive prevention strategy is carried out by improving environmental sanitation, drinking water and food production in addition to early detection and adequate treatment (early detection and prompt treatment) and effective clinical management (Bakhtiar et al., 2020).

Cleanliness is a human effort to protect themselves and their environment from everything that is dirty and disgusting in order to create and preserve a healthy and comfortable life. Cleanliness is a requirement for health, and health is one of the factors that can provide

happiness. On the other hand, dirty not only destroys beauty but can also cause various diseases, and illness is one of the factors that causes suffering.

Prevention of typhoid disease must be linked to clean and healthy living habits such as maintaining a hygienic diet and a clean and comfortable environment, especially for children who do not pay attention to cleanliness and health. The way to reduce the possibility of being attacked by salmonella thypi bacteria, every child aged 7-12 years is expected to maintain personal hygiene such as washing their hands before or after eating, paying attention to the quality of the food and drinks they will consume, don't forget for parents to always take care of clean environmental sanitation and also implementing clean and healthy living habits to avoid various types of diseases, especially typhoid disease (Kustiawan, 2019).

From the results of a pre-survey conducted by researchers at Pirngadi Hospital, Medan, typhoid disease is included in the top 10 inpatient diseases at Pirngadi Hospital, Medan, with a total of 628 patients in 2022. The aim of this research is to analyze the relationship between clean living behavior and environmental sanitation in Thyphoid patients at DR Pirngadi Regional Hospital, Medan.

Methods

This type of research is an analytical survey with a cross sectional design. The survey method is a quantitative research method used to obtain data that occurred in the past or currently, about beliefs, opinions, characteristics, behavior, variable relationships and to test several hypotheses about sociological and psychological variables from samples taken from certain populations, collection techniques data with observations (interviews or questionnaires) that are not in-depth, and research results tend to be generated (Sugiyono, 2019). This research design uses cross sectional. According to Notoatmodjo (2018), Cross Sectional is research that studies risk factors and effects, by approaching, observing or collecting data at the same time. With the aim of finding out the relationship between clean living behavior and environmental sanitation in typhoid patients at DR Pirngadi Regional Hospital, Medan. This research was conducted at RSUD DR Pirngadi Medan which is located at Jl. Prof. H.M. Yamin No. 47, Perintis, Kec. Medan Team., Medan City, North Sumatra 20234.

Result and Discussion

Frequency Distribution of Research Sample Characteristics Based on Age

The following are the results of research on the frequency distribution of characteristics of the research sample based on age.

Table 1. Frequency Distribution of Study Sample Characteristics by Age

Age	n	%
0 - 10 Years	15	10,0
11 - 25 Years	114	76,0
> 25 Years	21	14,0
Total	**150**	**100**

Table 1 describes the frequency distribution of sample characteristics by age. The research sample with the age of 0-10 years was 15 people with a percentage of 10%, the research sample with the age of 11-25 years was 114 people with a percentage of 76% and the research sample aged >25 years was 21 people with a percentage of 14% of the total sample in this study as many as 150 people. From these results can be seen the majority of respondents in this study aged 11-25 years.

Frequency Distribution of Research Sample Characteristics by Sex

The following are the results of research on the frequency distribution of research sample characteristics by gender.

Table 2. Frequency Distribution of Research Sample Characteristics by Sex

Gender	n	%
Law - Law	103	68,7
Woman	47	31,3
Total	**150**	**100,0**

Table 2 describes the frequency distribution of research sample characteristics by sex. The study sample with male sex was 103 people with a percentage of 68.7% and the research sample with female gender was 47 people with a percentage of 31.3% of the total sample in this study as many as 150 people. From these results, it can be seen that the majority of samples in this study are male.

Frequency distribution of research sample characteristics based on recent education

The following are the results of research on the frequency distribution of research sample characteristics based on recent education.

Table 3. Frequency distribution of research sample characteristics based on recent education

Recent Education	n	%
Not yet in school	2	1,3
SD	16	10,7
SMP	24	16,0
SMA	78	52,0
Diploma	15	10,0
Bachelor	15	10,0
Total	**150**	**100**

Table 3 describes the frequency distribution of research sample characteristics based on recent education. The research sample with the status of unschooled education was 2 people with a percentage of 1.3%, the research sample with the last elementary school education was 16 people with a percentage of 10.7%, the research sample with the last junior high school education was 24 people with a percentage of 16%, the research sample with the last high school education was 78 people with a percentage of 52%, the research sample with the last Diploma education was 15 people with a percentage of 10%, the sample of research with the last undergraduate education was 15 people with a percentage of 10% of the total sample in this study as many as 150 people. From these results, it can be seen that the majority of samples in this study had a high school education.

Data Quality Test Results

Research Data Normality Test

Table 4. Normality Test Results

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		150
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.32352851
Most Extreme Differences	Absolute	.063
	Positive	.054

	Negative	-.063
Test Statistic		.063
Asymp. Sig. (2-tailed)		.200[c,d]
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		
d. This is a lower bound of the true significance.		

Table 4 describes the results of the normality test using the *Kolmogorov-Smirnov Test* where the results show that the sig values are 0.200 > 0.05 which indicates that the data in this study are normally distributed.

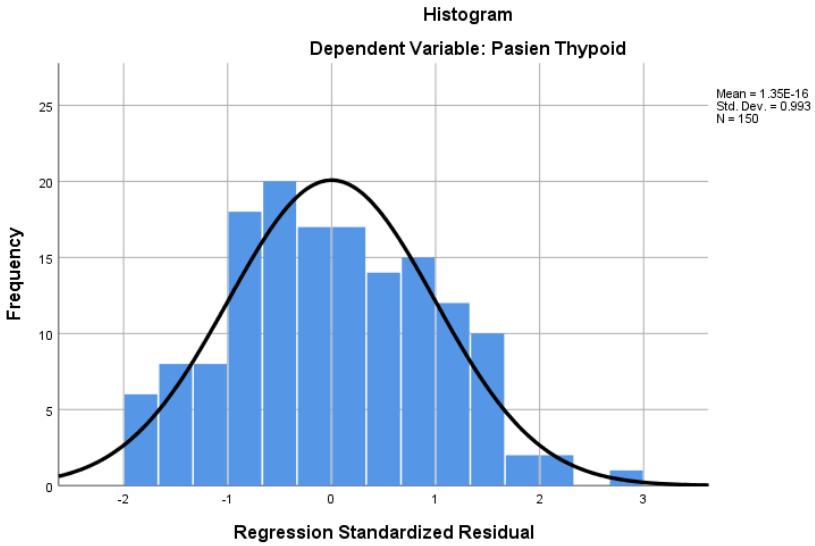

Figure 1. Histogram

Based on the results of the normality test using the histogram graph in figure 1 above, it shows that the pattern is normally distributed. The distribution of data is bell-shaped and does not deviate left or right so that the data is distributed normally.

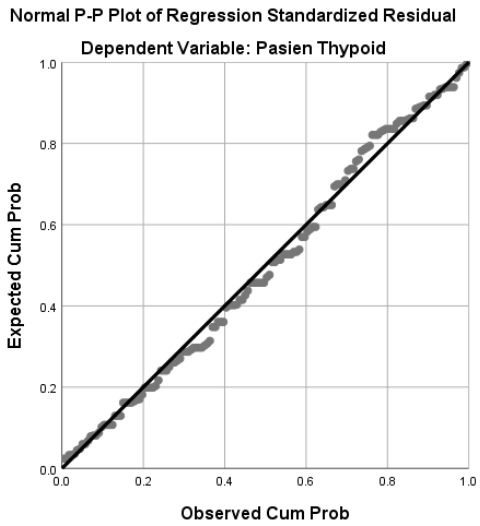

Figure 2. Grafik Normality Probability Plot

Based on the results of the normality test using the Normal PP Plot Test in figure 2 above, it shows that the data spreads around the diagonal line and follows the direction of the diagonal line. This indicates that the data is normally distributed.

Univariate Analysis Results

Clean Living Behavior (X1)

The results of univariate analysis on net living behavior variables can be seen in table 4.5 below:

Table 5. Clean Living Behavior

Clean Living Behavior	n	%
Good	62	41,3
Bad	88	58,7
Total	**150**	**100**

Table 5 describes the results of research from univariate analysis of the assessment of the research sample regarding clean living behavior variables. The results showed that the sample in this study whose clean living behavior was good was 62 with a percentage of 41.3%, and the study sample whose clean living behavior was not good was 88 with a percentage of 58.7% of the total sample in this study as many as 150 samples. From these results, it can be seen that the majority of samples in this study have bad clean living behavior.

Environmental Sanitation (X2)

The results of univariate analysis on environmental sanitation variables can be seen in the following table 6:

Table 6. Environmental Sanitation

Environmental Sanitation	n	%
Good	48	32
Bad	102	68
Total	**150**	**100**

Table 6 describes the results of research from univariate analysis of the assessment of the research sample on environmental sanitation variables. The results showed that the samples in this study with good environmental sanitation were 48 with a percentage of 32%, and the research samples with poor environmental sanitation were 102 with a percentage of 68% of the total samples in this study as many as 150 samples. From these results, it can be seen that the majority of samples in this study have poor environmental sanitation.

Results of Bivariate Analysis

The Relationship of Clean Living Behavior in Thyfoid Patients at RSUD DR Pirngadi Medan

The following are the results of research on the relationship between clean living behavior in thyfoid patients at RSUD DR Pirngadi Medan which can be seen in table 7 below.

Table 7. The Relationship of Clean Living Behavior in Thyfoid Patients at RSUD DR Pirngadi Medan

Variable	*Sig. (2-tailed)*	*Pearson Correltion*
Clean Living Behavior Against Thyfoid Fever	0,000	0,684

From table 7 above, it shows that between clean living behavior and the incidence of typhoid fever in typhoid patients at DR Pirngadi Regional Hospital, Medan, there is a correlation coefficient (r) of 0.684, which shows that clean living behavior has a relationship with the incidence of typhoid fever in typhoid patients at DR Pirngadi Regional Hospital. The field with

the level of relationship is in the strong category, and the correlation is significant because p < 0.05 (0.000 < 0.05).

From these results it can be concluded that there is a relationship between clean living behavior and the incidence of typhoid fever in typhoid patients at DR Pirngadi Regional Hospital, Medan.

Relationship between Environmental Sanitation in Thyphoid Patients at DR Pirngadi Regional Hospital, Medan

The following are the results of research regarding the relationship between environmental sanitation in typhoid patients at RSUD DR Pirngadi Medan which can be seen in table 8 below.

Table 8. Environmental Sanitation Relationship in Thyfoid Patients at RSUD DR Pirngadi Medan

Variable	*Sig. (2-tailed)*	*Pearson Correltion*
Environmental sanitation against thyfoid fever	0,000	0,505

From table 8 above, it shows that between environmental sanitation and the incidence of thyfoid fever in thyfoid patients at RSUD DR Pirngadi Medan, there is a correlation coefficient (r) of 0.505, which shows that environmental sanitation has a relationship with the incidence of thyroid fever in thyfoid patients at RSUD DR Pirngadi Medan with the level of relationship in the medium category, and the correlation is significant because p < 0.05 (0.000 < 0.05).

From these results, it can be concluded that there is a relationship between environmental sanitation and the incidence of thyfoid fever in thyfoid patients at RSUD DR Pirngadi Medan.

Multivariate Analysis Results

Before the multivariate test was carried out, there was a selection of variables where the variables that could be carried out by the multivariate test were variables that had a sig value of < 0.05 when in bivariate analysis. The following are the results of variable selection for multivariate analysis.

Table 9. Variable selection for mulitivariate test

Variable	P-Value	Candidate
Clean Living Behavior (X1)	0,000	Yes
Environmental Sanitation (X2)	0,000	Yes

From table 9 it can be seen that the two independent variables in this study have a p value of < 0.05. From these results, all variables X1 and X2 enter the multivariate test model in table 4.10 below:

Table 10. Multivariate Test Results

Variable	F	Sig
Clean Living Behavior (X1)		
	97,919	0,000
Environmental Sanitation (X2)		

Table 10 describes the results of multivariate analysis on the variables of clean living behavior (X1) and environmental sanitation (X2) on the incidence of thyfoid fever in thyfoid patients at RSUD DR Pirngadi Medan. From the table can be seen the significance value of 0.000 < 0.05 which means that the independent variables in this study are jointly or simultaneously related to the dependent variable, namely the incidence of thyfoid fever in thyfoid patients at DR Pirngadi Hospital Medan.

Table 11. The independent variable most related to the dependent variable

Variable	t
Clean Living Behavior (X1)	10,406
Environmental Sanitation (X2)	5,962

Table 11 describes the results regarding the independent variable most associated with the dependent variable in this study. From the results of the study, it can be seen that the highest t value is found in the net living behavior variable (X1), which is 10.406, from this result it can be concluded that the independent variable that most affects the dependent variable in this study is the net living behavior variable (X1).

The Relationship of Clean Living Behavior in Thyfoid Patients at RSUD DR Pirngadi Medan

The results of research regarding the relationship between clean living behavior in typhoid patients at DR Pirngadi Medan Hospital have been completed with results showing that the sample in this study whose clean living behavior was good was 62 with a percentage of 41.3%, and the research sample whose clean living behavior was not both 88 with a percentage of 58.7% of the total samples in this study of 150 samples. From these results, it can be seen that the majority of the samples in this study had poor hygiene behavior.

Between clean living behavior and the incidence of typhoid fever in typhoid patients at DR Pirngadi Regional Hospital, Medan, there is a correlation coefficient (r) of 0.684, which shows that clean living behavior has a relationship with the incidence of typhoid fever in typhoid patients at DR Pirngadi Hospital, Medan, with the level of relationship being at strong category, and the correlation is significant because $p < 0.05$ ($0.000 < 0.05$). From these results it can be concluded that there is a relationship between clean living behavior and the incidence of typhoid fever in typhoid patients at DR Pirngadi Regional Hospital, Medan.

The results of this research are in line with research by Brockett et al. (2020) with the title research on the relationship between sanitation and personal hygiene with the incidence of typhoid fever in children aged 1-5 years in the Bergas Community Health Center working area in 2018 where the results show that there is a relationship between personal hygiene and the incidence of thiophid fever in children aged 1-5 years ($p=0.024$, OR= 3.215).

Personal hygiene is a condition of fulfilling physical health requirements individually or individually. Personal hygiene can influence the occurrence of infectious diseases. Avoiding various infectious diseases requires individual awareness to fulfill their need for hygiene (Muhammad et al., 2020). This can be realized by having living habits that meet the requirements. This poor personal hygiene can take the form of unclean and healthy behavior by members of the community, such as body hygiene, before and after eating, using eating utensils that have been used before (not washed immediately, reused, or even if washed but not clean), not using a toilet. or a toilet for defecation or urination (Medise et al., 2019). Personal hygiene behavior, such as maintaining clean hands, nails, teeth and mouth, clothes and hair, so that there are no disease agents, is an important aspect that can influence individual health (Ardiaria, 2019).

Based on the results of research, theory and related research, researchers assume that poor clean living behavior is one of the causes of typhoid. This is because lack of personal hygiene, the environment and food can become a breeding ground for Salmonella Typhi germs which, if they enter the body, can cause someone has typhoid.

Relationship between Environmental Sanitation in Thyphoid Patients at DR Pirngadi Regional Hospital, Medan

The results of research regarding the relationship between clean living behavior in typhoid patients at DR Pirngadi General Hospital in Medan have been completed with results showing that the sample in this study had good environmental sanitation as many as 48 with a percentage of 32%, and the research sample whose environmental sanitation was not good was 102 with a percentage of 68% of the total samples in this study of 150 samples. From these results it can be seen that the majority of samples in this study had poor environmental sanitation.

Between environmental sanitation and the incidence of typhoid fever in typhoid patients at DR Pirngadi Regional Hospital, Medan, there is a correlation coefficient (r) of 0.505, which indicates that environmental sanitation has a relationship with the incidence of typhoid fever in typhoid patients at DR Pirngadi General Hospital, Medan, with the level of relationship being in the medium category. , and the correlation is significant because $p < 0.05$ ($0.000 < 0.05$). From these results it can be concluded that there is a relationship between environmental sanitation and the incidence of typhoid fever in typhoid patients at DR Pirngadi Regional Hospital, Medan.

The results of this research are in line with research conducted by Fachrizal et al. (2022) with the title research on factors related to the incidence of typhoid fever in children at the Bukittinggi National Stroke Hospital in 2019 where the results show that there is a relationship between environmental sanitation and the incidence of typhoid fever in children at home. Bukittinggi National Stroke Hospital in 2019. The same results were also obtained from research conducted by Brockett et al. (2019) regarding the relationship between sanitation and personal hygiene and the incidence of typhoid fever in children aged 1-5 years in the working area of the Bergas Health Center in 2018, as many as 45 patients had cases. The highest number was unhealthy environmental sanitation, 32 patients (71.1%).

An unhealthy and poorly maintained environment can give rise to bacteria that are transmitted through food. Environmental sanitation is the health status of an environment which includes housing, sewage disposal, provision of clean water, and so on. According to WHO, environmental sanitation is an effort to control all factors in the human physical environment that may cause things that are detrimental to physical development, health and survival of humans, such as poor food presentation, poor food processing and poor food storage so that can be exposed to Salmonella Typi bacteria and cause typhoid fever.

Conclusion

Based on the results and discussion, it can be concluded that there is a relationship between clean living behavior in Thyphoid patients at DR Pirngadi Regional Hospital, Medan, p - value < 0.05. There is a relationship between environmental sanitation in Thyphoid patients at RSUD DR Pirngadi Medan, p - value < 0.05. There is a relationship between clean living behavior and environmental sanitation in Thyphoid patients at DR Pirngadi Regional Hospital, Medan, p - value < 0.05. The independent variable that is most related to typhoid patients at RSUD DR Pirngadi Medan is the variable clean living behavior.

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