



The relationship between body temperature and diet on typhoid fever among toddlers aged 3 – 5 years

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ABSTRACT

Background: Typhoid fever is a significant health problem in many countries. Globally, it is estimated that 21 million toddlers suffer from this disease each year.

Purpose: This research aimed to analyze the relationship between handling body temperature and diet on the length of stay for typhoid fever among toddlers.

Methods: This research was a cross-sectional study design. The population in this study were 87 toddlers with typhoid fever Lepo-Lepo Health Care Center. The sampling technique was purposive sampling and obtained a total sample of 46 children under five.

Results: We found that Treatment of body temperature on length of stay ($X^2 = 5.642$; $p = 0.003$) and diet management on length of stay ($X^2 = 4.920$; $p = 0.001$) at the level of confidence 95% ($\alpha = 0.05$). It means that there is a relationship between handling body temperature and diet with the length of stay in toddlers with typhoid fever.

Conclusions: This study provides information about the body temperature and diet contributing to toddlers with typhoid fever. Clinical and community nursing can provide intervention by considering temperature and diet.

Keywords: typhoid fever; length of stay; toddler; body temperature; diet

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INTRODUCTION

Typhoid fever or typhus abdominalis is an infectious disease characterized by symptoms of fever for seven days and usually occurs in the digestive tract, gastrointestinal disturbances and impaired consciousness (Longley et al., 2020). This disease is caused by salmonella typhosa and is only found in humans (Marchello et al., 2019). Transmission of this disease almost always occurs through contaminated food and drink. Typhoid fever is a significant health problem in many countries. Globally, it is estimated that 21 million people suffer from this disease each year and 222,000 cause death. In developed countries, an estimated 5,700 cases occur annually, and typhoid fever cases affect about 21.5 million people yearly (Atikilt Yemata et al., 2021).

The incidence of typhoid fever in the world is quite significant.

Nursing and Healthcare Practices

- *During illness condition, body temperature on toddlers become an important data for nurses and health care teams.*
- *Body temperature and diet management monitoring should be initiated by nursing during assessment and implemented nursing intervention.*
- *Providing proper intervention to reduce body temperature among toddlers should be performed by nurses.*

Typhoid fever worldwide in 2002 was around 16 million per year, 600,000 of which caused deaths (Antillón et al., 2017). In 2007 typhoid fever became 17 million cases and 600 thousand deaths annually worldwide and caused 216,510 deaths in children. According to WHO, the incidence of typhoid fever reaches 16-600 deaths yearly. In Asia, typhoid fever is still relatively high. In Southeast Asia and Africa, the risk factors for abdominal typhus infection are lack of handling body temperature, contact with typhoid patients, eating unhealthy and clean food such as oily food and food sold on the roadside, and open and dusty food. Indonesia's health profile in 2016 shows the incidence of typhoid fever is 358,810/100,000 cases per year, and typhoid fever ranks 3rd out of the ten most disease patterns of hospitalized patients in Indonesia (Marchello et al., 2019).

Appropriate and comprehensive handling of typhoid patients, not only by giving antibiotics but also excellent and correct nursing care and proper diet settings to accelerate the healing process of patients with typhoid fever. Handling body temperature is the handling of abnormally increased body temperature that exceeds the standard limit, which is more than 38°C (Steele et al., 2016). In handling body temperature, nursing care needs to be done to monitor the patient's body temperature to find out the patient's vital signs and condition (Pakkanen et al., 2012). This is adjusted to determine the patient's progress every day during hospitalization and as a reference to assess the general condition of patients with typhoid

fever (Duff et al., 2020). Ineffective handling of body temperature increases the length of stay in patients with typhoid fever, where fever can be an early sign of infection. Still, fever can also be caused by metabolic disorders and other causes (Pakkanen et al., 2012).

The typhoid fever diet is a diet that serves to meet the food needs of typhoid sufferers in the form of low-fibre soft foods. The types of diets included in the digestive system disorder diet are gastric, low waste, and low fibre. The primary purpose of the typhoid fever diet is to meet the nutritional needs of typhoid fever sufferers and prevent recurrence (Barac et al., 2018). The management of typhoid fever diet is a diet that serves to meet the food needs of typhoid sufferers in the form of low-fibre soft foods. Patients with typhoid fever during treatment must follow the diet instructions recommended by the doctor for consumption (Brockett et al., 2020).

The data of Lepo-Lepo Health Care Center showed that the cases of typhoid fever that received treatment in the inpatient room were extensive where typhoid fever was a disease that was always included in the ten most diseases at the Lepo-Lepo Health Center from year to year. The data recorded in the inpatient register of the Lepo-Lepo Health care Center in the inpatient register of inpatients totalled 282 cases. Among those diagnosed with typhoid fever were 87 people in the inpatient register of the Lepo-Lepo Health Care Center in the average register. On average, patients with typhoid fever are treated for 4-5 days (Amzal Mortin Andas et al., 2020; Mulyana, 2022). This study aimed to determine the relationship between body temperature treatment and diet on the length of stay for typhoid fever among toddlers in the Lepo-Lepo Health Center inpatient room.

METHOD

Design

This study uses an analytical survey method that uses quantitative methods with a cross-sectional design.

Sample

The population in this study were all patients with a positive diagnosis of Typhoid Fever who were registered in the Lepo-Lepo Public Health Center, Kendari City In Indonesia inpatient room and recorded in the medical

records of 87 people. The sampling technique in this study was purposive sampling because the researchers drew samples based on the following criteria: parents with toddlers with typhoid fever can be invited to communicate and are willing to be respondents in this study.

Instruments

The research instrument in the form of a questionnaire was made by the researcher and used to obtain data in this study. Respondents will be measured for handling body temperature and proper diet when hospitalized.

Data Analysis

Univariate analysis was carried out to describe each variable; namely, the dependent variable was the handling of body temperature and diet management, while the independent variable was the length of hospitalization. In addition, a bivariate analysis was conducted to determine whether or not there was a relationship between handling body temperature and diet on the length of stay for typhoid fever in children under five in the Lepo-Lepo Health Center inpatient room. The analysis used is the chi-square test with a significance value of 0.05.

Ethical Consideration

Ethical Clearance for this study was obtained from the Bani Saleh University (Ref No: EC.0183/KEPK/STKBS/VI/2021). The confidentiality of participants is strictly protected. Informed consent was given to the toddler's parents.

RESULTS

Univariate Analysis

The univariate analysis was based on the relationship between handling body temperature and diet on the length of stay for typhoid fever in children under five in the Lepo-Lepo Health Care Center inpatient room. [Table 1](#) shows that among the 46 research respondents aged 0-24 months, there are 26 respondents (56.6%), and at the age of 25-60 months, there are 20 respondents (43.4%). Based on the distribution of respondents' gender groups, it can be seen in [Table 1](#) that of the 46 research respondents, the number of female respondents was more than male; 27 were female respondents (58.7%). In comparison, 19 respondents were male (41.3%).

Table 1. Distribution of age and gender (n=46)

Variables	n	%
Age		
0-24 Months	26	56.6
25-60 Months	20	43.4
Gender		
Male	19	41.3
Female	27	58.7

Bivariate Analysis

Analysis of the Relationship between Handling Body Temperature and Length of Hospitalization for Typhoid Fever in Toddlers in the Lepo-Lepo Health Center inpatient room, Kendari City, which was analyzed by Chi-Square test, the result in [table 2](#) shows that in this study, from 46 respondents who were treated with low temperature with the length of stay five days totaled one respondent (3.3%) and treatment with good temperature with the length of stay five days amounted to 10 respondents (66.7%). On the other hand, the respondents who handled the temperature less with a length of stay > five days totalled 30 respondents (96.7%), and good temperature treatment with a length of stay > 5 days amounted to 5 respondents (33.3%) ([Table 2](#)).

Based on statistical tests using the chi-square test, the calculated X^2 value is 5,642 > X^2 table = 3,481, with a value of 0.003 at a 95% confidence level ($\alpha = 0.05$) which means there is a relationship between body temperature handling and length of time care for toddlers with typhoid fever ([Table 2](#)).

Analysis of the Relationship between Diet Management and Length of Hospitalization for Typhoid Fever in Toddlers in the Lepo-Lepo Health Center inpatient room, Kendari City, was analyzed by testing (Chi-Square), as shown in [table 3](#). The analysis results in [table III](#) show that in this study, from 46 respondents who were treated with an inadequate diet with length of stay of 5 days, one respondent (3.3%) and good diet treatment with length of stay of 5 days amounted to 11 respondents (68.8%). Meanwhile, the respondents who had poor diet handling with a length of stay > 5 days were 29 respondents (96.7%), and good diet management with length of stay > 5 days were 5 respondents (31.2%) ([Table 3](#)).

Based on the results of statistical tests using the chi-square test, the value of X^2 count is 4.920 > X^2 table = 3.481, with a value of

Table 2. Relationship between handling body temperature and length of stay in toddlers with typhoid fever

Body Temperature Handling	Length of Treatment				Total		X2 Hits	X2 Table	p
	5 days		> 5 days		n	%			
	n	%	n	%					
Not enough	1	3.3	30	96.7	31	100			
Good	10	66.7	5	33.3	15	100	5,642	3,481	0.003
Total	11	23.9	35	76.1	46	100			

Table 3. Relationship between diet management and length of stay in toddlers with typhoid fever

Diet Management	Length of Treatment				Total		X2 Hits	X2 Table	p
	5 days		> 5 days		n	%			
	n	%	n	%					
Not enough	1	3.3	29	96.7	30	100			
Good	11	68.8	5	31.2	16	100	4.920	3,481	0.001
Total	12	26.1	34	73.9	46	100			

0.001 at a 95% confidence level ($\alpha = 0.05$) it meaning there is a relationship between diet management and length of stay in toddlers with typhoid fever (Table 3).

DISCUSSION

Typhoid fever temperature can be more than 38° c, which usually appears in the afternoon and evening. This fever lasts more than 3 days or even more than 7 days. In handling body temperature, nursing care needs to be done to monitor the patient’s body temperature to find out the patient’s vital signs and condition. This is adjusted to determine the patient’s progress every day during hospitalization and as a reference to determine the general condition of patients with typhoid fever (Raab et al., 2022). According to research, giving warm compresses to patients aims to help lower body temperature through evaporation. Evaporation itself is the loss of heat by the process of sweating occurs because the sweat in that part of the skin evaporates. Warm compresses can be applied to the forehead, groin, axilla, and even rubbed all over the body using a towel. Thus speeding up the evaporation process because there are large blood vessels in that area. The length of stay of typhoid fever patients is determined by the symptoms accompanying typhoid fever, such as fever (Opara, 2021).

This results same with Nurwahuni’s 2009 research, which explains that there is a body mechanism for warm compresses to reduce body temperature, namely by giving

warm compresses to areas of the body that The signal is sent through the spine to the hypothalamus, causing stimulation of heat receptors located in the hypothalamus which in turn the effector system causes a peripheral vasodilation reaction and sweating as a signal. Vasodilation occurs due to the influence of the anterior hypothalamus causing changes in blood vessel size which are regulated by the vasomotor center in the medulla oblongata of the brain stem. The impact of vasodilation causes a waste of energy or heat through the skin (sweating). This is expected to lower body temperature so that it reaches normal conditions.

The typhoid fever diet is a diet that serves to meet the food needs of typhoid sufferers in the form of low-fibre soft foods. Infectious diseases can cause loss of appetite, so food intake is inadequate, even though diet management in patients with infectious diseases increases. Changes in diet often occur in patients with infectious diseases who are hospitalized at the Public Health Center. Food intake from hospitals is one of the factors for changes in dietary status that occur in inpatients at hospitals and health centers.

Our results in this research are accordance with other studies regarding the level of energy and protein adequacy with the length of treatment for typhoid fever patients. So the diet therapy given to typhoid fever patients is adjusted to the disease, which is expected to be able to help to heal.

Limitation of Study

This study has several limitations, including the lack of samples. Nevertheless, in this study, one should be able to see a more profound effect, not only limited to the relationship between variables.

CONCLUSION

The result of this study at Lepo-Lepo Health Care Center in Kendari City, it can be concluded that there is a relationship between handling body temperature and diet on the length of stay for typhoid fever in children under five in the Lepo-Lepo Health Care Center inpatient room.

Declaration of Interest

None

Acknowledgment

Authors are responsible for disclosing any interests that may affect their ability to present the data objectively. This research uses independent funds. Diversified mutual funds or investment trusts do not constitute a conflict of interest. If there is any doubt about whether an interest is relevant or significant, it is wise to disclose it. Readers will benefit from transparency, including knowing the affiliations of authors and contributors. The data source in this study was obtained from the Lepo-Lepo Public Health Center, Kendari City.

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Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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