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## **RELATIONSHIP BETWEEN CHARACTERISTICS OF INPATIENTS WITH TYPHOID FEVER (TF) AND LENGTH OF STAY (LOS) IN THE HOSPITAL**

Sri Wahyuningsih Nugraheni<sup>1</sup>, Ilyas Syafiq Darul<sup>2</sup>, Aquamarine Lathifatunniisaa<sup>1</sup>, Putri Widigdy<sup>1</sup>, Sella Yulia Sari<sup>1</sup>

<sup>1</sup>Faculty of Health Sciences, Universitas Duta Bangsa, Jl. Bhayangkara No.55, Tipes, Serengan, Surakarta, Jawa Tengah 57154, Indonesia

<sup>2</sup>Institute of Medical Science Technology, University of Kuala Lumpur, A1, 1, Jalan TKS 1, Taman Kajang Sentral, 43000 Kajang, Selangor, Malaysia

\*[sri\\_wahyuning@udb.ac.id](mailto:sri_wahyuning@udb.ac.id)

### **ABSTRACT**

Patient characteristics are unique characteristics that each patient has. Length Of Stay (LOS) between patients varies depending on the patient's condition. Purpose: This study aimed to determine the relationship between the characteristics of Typhoid Fever inpatients and LOS. Method: This type of research is analytical research. The research sample was 203 medical record documents. Data collection using interviews, observations, and work tables. Data processing by collecting, editing, tabulating, calculating, and presenting data. Results: Univariate analysis found that the highest LOS was in the less than ideal category (<6 days), the highest age characteristics were in young people and adults (15-49 years), the highest gender was male, the highest payment method was in the government insurance category, the highest exit method was in the homecoming category, the highest occupation was in the unemployed/not yet employed category. The results of the bivariate analysis of the chi-square test showed the characteristics of age ( $p = 0.012$ ), gender ( $p = 0.473$ ), payment method ( $p = 0.485$ ), exit method ( $p = 0.570$ ), and occupation ( $p = 0.021$ ). Conclusion: There is a relationship between age and occupation characteristics with LOS, and there is no relationship between gender characteristics, payment method and exit method with LOS.

Keywords: characteristics; hospitalization; length of stay; typhoid fever

### **INTRODUCTION**

Based on WHO data (2019), typhoid fever is still a public health problem in many developing regions in Africa, the Eastern Mediterranean, Southeast Asia and the Western Pacific. In 2019 estimates, there were around 9 million cases of typhoid fever each year resulting in around 110,000 deaths per year. The risk of typhoid fever is higher in children. Based on the 2022 Performance Report from the Center for Health Financing and Decentralization Policy, Health Development Policy Agency, Ministry of Health of the Republic of Indonesia, according to the utilization review dashboard developed, typhoid fever is in the top 10 diseases with the highest number of visits, namely 883,658 patients and the top 20 diseases with the highest average claims during the period 2016-2022. Based on the results of a preliminary study at RSU Hidayah Boyolali, typhoid fever is the number 1 disease in the data of the top 10 diseases in 2022-2023. This is inseparable from the characteristics of each patient. Patient characteristics are one of the factors causing the high number of typhoid fever cases. Patient characteristics are the unique characteristics of each patient that distinguish them from other patients. Patient characteristics in this study include age, gender, payment method, discharge method, and occupation. In addition, the Length Of Stay (LOS) between one patient and another varies depending on the patient's condition. Medical records are documents containing patient identity data, examinations, treatments, actions, and other services that have been provided to patients. Medical records are basic data in hospital statistical calculations and hospital reporting (Depkes RI, 2005., Kemenkes RI, 2011., Menkes RI, 2022). Based on this, the author is interested in

conducting research on the relationship between the characteristics of inpatients with typhoid fever and the Length Of Stay (LOS) of inpatients, so the author took the title Relationship between Characteristics of Inpatients with Typhoid Fever (TF) and Length Of Stay (LOS) in the hospital.

## METHOD

This study uses analytical research with a cross-sectional approach. The independent variables are patient characteristics (age, gender, payment method, discharge method, and occupation). The dependent variable is Length Of Stay (LOS). The population of the study was all medical record documents of typhoid fever inpatients totaling 411. The sampling technique used the simple random sampling method. The number of samples was determined using the slovin formula so that a sample of 203 was obtained. Data collection used primary data and secondary data. Primary data came from interviews with the head of medical records. Secondary data came from medical record data of typhoid fever inpatients, patient index and disease index. Data collection techniques through observation and interviews. Data processing used the SPSS version 23 application with univariate and multivariate data analysis.

## RESULTS AND DISCUSSION

In this study, univariate analysis was conducted to determine the frequency and percentage distribution in the form of a table of the variables studied. The results of the univariate analysis of this study are as follows:

Table 1.  
Frequency Distribution of LOS of Typhoid Fever Patients in 2023

Num.	Category	f	%
1	Less than ideal (<6 Hari)	175	86,21
2	Ideal (6-9 Hari)	28	13,79
3	More than ideal (>9 Hari)	0	0

Based on table 1, the results of the LOS frequency distribution of each category can be seen. The category less than ideal (<6 days) was 175 patients with a percentage of 86.21%. The ideal category (6-9 days) was 28 patients with a percentage of 13.79%. The category more than ideal (>9 days) was 0 patients. The shortest treatment duration is 1 day and the longest treatment duration is 20 days (Zaidan, et al: 2020). The results of Kriswanti and Sugeng's research: 2017 stated that the longer the treatment period, the lower the quality of medical performance because patients have to be treated longer.

Table 2.  
Frequency Distribution of Age of Typhoid Fever Patients in 2023

Num.	Category	f	%
1	Infants & Children (0-14 Tahun)	73	35,96
2	Young People & Adults (15-49 Tahun)	96	47,29
3	Elderly People ( $\geq$ 50 Tahun)	34	16,75

Based on table 2, it is known that typhoid fever patients treated in 2023 were mostly in the category of young people & adults (15-49 years) as many as 96 patients with a percentage of 47.29%. The results of this study also show that the category of infants & children (0-14 years) was 73 patients with a percentage of 35.96% and the category of the elderly ( $\geq$ 50 years) was 34 patients with a percentage of 16.75%. In the study by Muthoharoh, et al: 2020, Characteristics of typhoid fever patients based on age, suffered by late adolescents aged 17-25 years, as many as 43 patients from 185 samples.

Table 3.  
Frequency Distribution of Gender of Typhoid Fever Patients in 2023

Num.	Category	f	%
1	Male	107	52,71
2	Female	96	47,29

Based on table 3, typhoid fever patients in 2023 were male, with a percentage of 52.71% and the number of female patients was 96 patients with a percentage of 47.29%. In the study by Muthoharoh, et al: 2020, the characteristics of typhoid fever patients were mostly suffered by women with a percentage of 64.3% or as many as 119 patients. The results of Kriswanti and Sugeng's research: 2017 stated that gender does not affect costs, there is a possibility that stress factors affect the length of stay of patients so that it will have an impact on the amount of costs incurred.

Table 4.  
Frequency Distribution of Typhoid Fever Patient Payment Methods in 2023

Num.	Category	f	%
1	General	3	1,48
2	Government Insurance	200	98,52
3	Private Insurance	0	0

Based on table 4 shows the payment method of typhoid fever patients, the number of patients who pay in general is 3 patients with a percentage of 1.48%. Patients who pay using government insurance are 200 patients with a percentage of 98.52%. Typhoid fever patients with the payment method category using private insurance are 0 patients.

Table 5.  
Frequency Distribution of Discharge Methods for Typhoid Fever Patients in 2023

Num.	Category	f	%
1	Discharged	201	99,01
2	At Patient Request	2	0,99
3	Referred	0	0
4	Deceased <48 Hours	0	0
5	Deceased ≥48 Hours	0	0
6	Transferred	0	0

Based on table 5, the number of typhoid fever patients with the discharge category was 201 patients with a percentage of 99.01%, patients with the APS category were 2 patients with a percentage of 0.99%. While patients with the referred category, died <48 hours, died ≥48 hours, and were transferred were 0 patients.

Table 6.  
Frequency Distribution of Occupations of Typhoid Fever Patients in 2023

Num.	Category	f	%
1	Not/Not Yet Working	91	44,83
2	Housewife	15	7,39
3	Laborer	31	15,27
4	Self-Employed	12	5,91
5	Employee	48	23,65
6	PNS / TNI / POLRI	2	0,98
7	Retiree	4	1,97

Based on table 6, it shows that typhoid fever patients who are not/have not worked are 91 patients with a percentage of 44.83%, patients in the housewife category are 15 patients with a percentage of 7.39%, patients in the laborer category are 31 patients with a percentage of 15.27%, patients in the self-employed category are 12 patients with a percentage of 5.91%, the private employee category is 48 patients with a percentage of 23.65%, the civil

servant/military/police category is 2 patients with a percentage of 0.98% and the retiree category is 4 patients with a percentage of 1.97%.

**The results of the bivariate analysis of this study are as follows:**

Table 7.

Relationship between Age and Length Of Stay (LOS) of Typhoid Fever Patients in 2023

Age Category	Length Of Stay (LOS)		Amount	P-Value
	Less than ideal (<6 Hari)	Ideal (6-9 Hari)		
Infants & Children (0-14 Tahun)	56	17	73	0,012
Young People & Adults (15-49 Tahun)	87	9	96	
Elderly People (≥50 Tahun)	32	2	34	

Based on table 7, it shows that the results of the bivariate analysis using the chi-square test, namely the p-value of 0.012 ( $p < 0.05$ ) which means that  $H_0$  is rejected and  $H_a$  is accepted, so it can be concluded that there is a relationship between age and Length Of Stay (LOS) of typhoid fever inpatients at RSUD Hidayah Boyolali in 2023.

Table 8.

Relationship between Gender and Length of Stay (LOS) of Typhoid Fever Patients in 2023

Gender Category	Length Of Stay (LOS)		Amount	P-Value
	Less than Ideal (<6 Hari)	Ideal (6-9 Hari)		
Male	94	13	107	0,473
Female	81	15	96	

Based on table 8, it shows that the results of the bivariate analysis using the chi-square test, namely the p-value of 0.473 ( $p > 0.05$ ) which means that  $H_0$  is accepted and  $H_a$  is rejected, so it can be concluded that there is no relationship between gender and Length Of Stay (LOS) of typhoid fever inpatients at RSUD Hidayah Boyolali in 2023.

Table 9.

Relationship between Payment Method and Length Of Stay (LOS) of Typhoid Fever Patients in 2023

Payment Method Category	Length Of Stay (LOS)		Amount	P Value
	Less than Ideal (<6 Hari)	Ideal (6-9 Hari)		
General	3	0	3	0,485
Government Insurance	172	28	200	
Private Insurance	0	0	0	

Table 10.

Relationship between Discharge Method and Length Of Stay (LOS) of Typhoid Fever Patients in 2023

Discharge Method Category	Length Of Stay (LOS)		Amount	P Value
	Less than Ideal (<6 Hari)	Ideal (6-9 Hari)		
Discharged	173	28	201	0,570
At Patient Request	2	0	2	
Referred	0	0	0	
Deceased <48 Hours	0	0	0	
Deceased ≥48 Hours	0	0	0	
Transferred	0	0	0	

Based on table 9, it shows that the results of the bivariate analysis using the chi-square test, namely that the p-value is 0.485 ( $p > 0.05$ ) which means that  $H_0$  is accepted and  $H_a$  is rejected, so it can be concluded that there is no relationship between payment method and Length of Stay (LOS) of typhoid fever inpatients at RSU Hidayah Boyolali in 2023. Based on table 10, it shows that the results of the bivariate analysis using the chi-square test, namely the p-value of 0.570 ( $p > 0.05$ ) which means that  $H_0$  is accepted and  $H_a$  is rejected, so it can be concluded that there is no relationship between the way of leaving and the Length Of Stay (LOS) of typhoid fever inpatients at RSU Hidayah Boyolali in 2023.

Table 11.  
Relationship between Occupation and Length Of Stay (LOS) of Typhoid Fever Patients in 2023

Occupation Category	Length Of Stay (LOS)		Amount	P Value
	Less than Ideal (<6 Hari)	Ideal (6-9 Hari)		
Not/Not Yet Working	70	21	91	0,021
Housewife	13	2	15	
Laborer	31	0	31	
Self-Employed	12	0	12	
Employee	43	5	48	
PNS / TNI / POLRI	2	0	2	
Retiree	4	0	4	

Based on table 11, it shows that the results of the bivariate analysis using the chi-square test, namely that the p-value is 0.021 ( $p < 0.05$ ), which means that  $H_0$  is rejected and  $H_a$  is accepted, so it can be concluded that there is a relationship between work and Length Of Stay (LOS) of typhoid fever inpatients at RSU Hidayah Boyolali in 2023

## DISCUSSION

### Relationship between age characteristics and Length Of Stay (LOS)

The results of statistical tests with chi-square analysis obtained a p value = 0.012 ( $p < 0.05$ ). This shows that there is a significant relationship between age and Length Of Stay (LOS) of typhoid fever inpatients. This is in line with Sasmita's research (2017) from the results of the bivariate analysis obtained a p value = 0.023 ( $p < 0.05$ ) which means that there is a significant relationship between age and Length Of Stay (LOS) of patients. This study is also in line with the research of Aisya, et al. (2024) which showed a p value = 0.001 ( $p < 0.05$ ) which means that there is a significant relationship between age and Length Of Stay (LOS) of typhoid fever patients. In the study by Mustamin, et al: 2022, the results of the Chi-Square test obtained a p-value (0.000)  $\leq \alpha$  (0.05), which means there is a relationship between age and typhoid fever. The results of this study differ from the research of Fernandes, et al: 2015, that the length of stay in children is influenced by body weight, so the length of stay in overweight children will be longer than in children with normal body weight. Length of stay in typhoid fever patients can be influenced by nutritional status, immune system, complications (Syahniar, et al: 2020). The results of the study by Harahap, et al: 2022, stated that there was no significant relationship between age and Length of Stay (LOS) at Imelda Hospital, Medan (P value = 0.368). The results of the study by Shiddiq, et al: 2022, obtained the results of the relationship between the length of hospitalization and age  $p = 0.599$  ( $p > 0.05$ ) which means there is no relationship between the length of hospitalization and age.

### Relationship between gender characteristics and Length of Stay (LOS)

The results of statistical tests with chi-square analysis obtained a p value = 0.473 ( $p > 0.05$ ). This shows that there is no relationship between gender and Length Of Stay (LOS) of typhoid fever inpatients. This is in line with the research of Sutaip, et al. (2023) that from the results of

the bivariate analysis obtained a p value = 0.955 ( $p > 0.05$ ) which means that there is no relationship between gender and Length Of Stay (LOS) of patients. This study is also in line with the research of Aisya, et al. (2024) which showed a p value = 0.172 ( $p > 0.05$ ) which means that there is no relationship between gender and Length Of Stay (LOS) of typhoid fever patients. In the study by Mustamin, et al: 2022, the results of the Chi-Square test obtained a p-value ( $0.453 > \alpha (0.05)$ ), which means there is no relationship between gender and typhoid fever. The results of Xie et al's (2022) study contradict the results of this study, because in Xie et al's (2022) study, male patients tended to have increased LOS. The results of the study by Harahap, et al: 2022, stated that there was no significant relationship between gender and Length of Stay (LOS) at Imelda Hospital, Medan (P value = 0.135).

### **Relationship between Payment Method Characteristics and Length of Stay (LOS)**

The results of the statistical test with chi-square analysis obtained a p value of 0.485 ( $p > 0.05$ ). This shows that there is no relationship between payment methods and Length Of Stay (LOS) of typhoid fever inpatients. This is in line with the research of Aisya, et al. (2024) which showed a p value of 0.860 ( $p > 0.05$ ) which means that there is no relationship between payment methods and Length Of Stay (LOS) of typhoid fever patients. This study is not in line with the research of Sasmita (2017) that from the results of the bivariate analysis obtained a p value of 0.021 ( $p < 0.05$ ) so it can be concluded that there is a relationship between payment methods and Length Of Stay (LOS) of patients.

### **Relationship between Characteristics of Discharge Method and Length of Stay (LOS)**

The results of the statistical test with chi-square analysis obtained a p value of 0.570 ( $p > 0.05$ ). This shows that there is no relationship between the way of exit and the Length of Stay (LOS) of typhoid fever inpatients. This is in line with Kautsar's (2024) study which showed a p value of 0.533 ( $p > 0.05$ ) which means that there is no relationship between the way of exit and the Length of Stay (LOS). This study is not in line with Pangesti's (2022) study that from the results of the bivariate analysis obtained a p value of 0.001 ( $p < 0.05$ ) so it can be concluded that there is a relationship between the way of exit and the Length of Stay (LOS) of patients.

### **Relationship between Occupation Characteristics and Length Of Stay (LOS)**

The results of the statistical test with chi-square analysis obtained a p value = 0.021 ( $p < 0.05$ ). This shows that there is a relationship between work and Length Of Stay (LOS) of typhoid fever inpatients. This is in line with Sutaip's (2023) research which showed a p value = 0.007 ( $p < 0.05$ ) which means that there is a significant relationship between work and Length Of Stay (LOS) of patients at the Brebes Health Center. This study is not in line with Pangesti's (2022) research that from the results of the bivariate analysis obtained a p value = 0.237 ( $p > 0.05$ ) so it can be concluded that there is no relationship between work and Length Of Stay (LOS) of patients.

LOS of inpatients is influenced by the type of disease, such as elective patients have Prolonged Length Of Stay (PLOS) (Besa, et al: 2023). Likewise, patients with mental illness have a longer length of stay (Singleton, et al: 2017). Length Of Hospital Stay (LOHS) of patients with Atrial Fibrillation (AF) is influenced by the patient's nutritional status (Czapla, et al: 2022). The results of Zuhakim's study: 2020, stated that there was a significant relationship between nutritional status ( $p = 0.032$ ) and type of disease ( $p = 0.016$ ) on the length of hospitalization. The length of hospitalization of patients is greatly influenced by the nutritional status of the patient and the type of disease the patient suffers from. Several factors that influence Length Of Hospital Stay in the NICU (LOS NICU) include: birth weight, gestational age, sepsis, necrotizing enterocolitis, bronchopulmonary dysplasia, and retinopathy of prematurity (Fu, et al: 2023).

LOS is complex, and cannot be determined by a single factor. Length-of-stay determinants models, which can be applied across medical settings, will help determine health care policy, costs, and planning and will ultimately allow future health care services to be more efficient and standardized (Schorr: 2012).

## **CONCLUSION**

Length Of Stay (LOS) of inpatients with Typhoid Fever with a category less than ideal (<6 days) as many as 175 patients with a percentage of 86.21%. The ideal category (6-9 days) as many as 28 patients with a percentage of 13.79%. The category more than ideal (>9 days) as many as 0 patients. The results of univariate analysis based on age characteristics, the highest percentage was in the young & adult category (15-49 years) as many as 96 patients with a percentage of 47.29%. The highest percentage of gender characteristics was in men as many as 107 patients with a percentage of 52.71%. The highest percentage of payment method characteristics was in the government insurance category in the form of BPJS as many as 200 patients with a percentage of 98.52%. The highest percentage of discharge method characteristics was in the homecoming category as many as 201 patients with a percentage of 99.01%. The highest percentage of work characteristics was in the unemployed/not yet working category as many as 91 patients with a percentage of 44.83%. The results of bivariate analysis with chi-square test on SPSS 23 obtained the results that there is a relationship between the variables of age ( $p = 0.012$ ) and occupation ( $p = 0.021$ ) with Length Of Stay (LOS) of typhoid fever patients because the  $p$  value  $< 0.05$ . The variables of gender ( $p = 0.473$ ), payment method ( $p = 0.485$ ) and exit method ( $p = 0.570$ ) have no relationship with Length Of Stay (LOS) because the  $p$  value  $> 0.05$ .

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