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Original Research Article

Factors related with length of stay (LOS) on digestive surgical patient in Dr. Wahidin Sudirohusodo hospital, Makassar, Indonesia

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ABSTRACT

Background: Length of stay (LOS) is to show how many days a patient is admitted to the hospital during one treatment period. The best length of daycare is 6-9 days. Some factors affect the length of stay of the patient. This study aims to determine the factors associated with the duration of treatment on digestive surgical patients in Dr. Wahidin Sudirohusodo Hospital, Makassar, Indonesia.
Methods: This research was analytical, descriptive research method using cross-sectional study design, and sampling used is total sampling technique with 419 patients. Data analysis was obtained to see the relationship between independent variables (sex, age, secondary diagnosis, surgery setting, surgery risk, and outcome) and the dependent variable (length of stay).
Results: The study found that there were four factors related to the duration of treatment of digestive surgical patients that are secondary diagnosis (p = 0.000), surgery setting (p = 0.000), surgery risk (p = 0.000), and out patient condition (p = 0.000). While no significant relation the age with p value = 0.140, and sex p value = 0.917 with length of stay.
Conclusions: There were four factors have a significant relationship with the length of stay (LOS) on a digestive surgical patient in dr. Wahidin Sudirohusodo Hospital such as secondary diagnosis, surgery setting, the risk of surgery and outpatient condition.

Keywords: Digestive patient, Length of stay, The setting of surgery, The risk of surgery

INTRODUCTION

Length of stay (LOS) is one of the parameters used to assess the efficiency of a hospital. The period of daycare in addition to indicating the level of ability of hospital management also shows the effectiveness of the hospital from the aspect of quality care (quality of care) conducted by professionals working in the hospital. When faced with surgery, the patient will experience various stressors. It is therefore desperate for information before and after surgery to enable patients and families to participate actively in minimizing the occurrence of complications.[1]

Length of stay is one of treatment aspect in the hospital that can be assessed and measured. The best period of treatment is 6-9 days.[2] Prolonged day of therapy may cause by a patient's medical condition or a nosocomial infection extending the duration of therapy may reach 5-20 days.[2] Duration of treatment may increase due to nosocomial infection to 13, 3 days, more extended two settings more than average. In addition to the medical condition, prolonged day of treatment can also be caused by non medical condition, such as administrative delay (hospital delay), poor planning in providing services to patients (administration delay) in the hospital, lack of proper plan in delivering services to patients (patient scheduling) policies in the medical field (medical system).[3]

The prevalence of major surgery in Indonesia is very high, as many as 75 major surgery cases have been conducted for three months with the specification of all surgical division cases of gastric surgery, pediatric surgery, oncology, plastic, thorax, vascular, orthopedic and urology. Over 60% of digestive instances, while the other percentage is evenly distributed in the case of other surgical division.[4]

A disease that is often found in the community is a digestive disease that requires surgery. According to statistics from the National Digestive Diseases Information Clearinghouse (NDDIC), about 60-70 million people worldwide are afflicted with the gastrointestinal illness in 1996. This number does not decrease and increase year by year so that the number of gastrointestinal patients hospitalized in 2002 reach 14 million people. While the death rate from gastrointestinal disease reached 234.000 people in the same year. So in 2008, the death rate from gastrointestinal surgery increase 12% from 2005 and 4,5% from 2007. Until now the gastrointestinal surgical disease is still one of the most common causes of death in the world.[5]

METHODS

The design of this study was descriptive analytic using cross-sectional study design. Data are extracting and analyzing from the medical record from Dr. Wahidin Sudirohusodo General Hospital, a top referral hospital with 900 bed in Makassar city, South Sulawesi Province, Indonesia. The data collection conducted in one year period, from January to December 2016. The study population was all of the postoperative patients of large and specialized surgical operation group which met inclusion and exclusion criteria. Total sample acquired were 419 patients. The collected data is processed using Microsoft Excel and Statistical Package for Social Sciences to summarize, clarify and present the data to obtain the expected statistical results. In the descriptive section, the calculation is done by the prevalence of sex, age, secondary diagnosis, surgery setting, surgery risk, outcome, and the length of stay. Then made the distribution of digestive surgery patient by gender, distribution of digestive surgery patients based on age, distribution of digestive surgical patient based on secondary diagnosis, distribution of digestive surgical patients based on surgery time, distribution of digestive surgical patients based on risk of surgery, distribution of digestive surgical patients based on out patient condition, distribution of digestive surgical patients based on out patient condition, and distribution of digestive surgical patients based on length of stay .

The univariate and bivariate analysis used for the analysis of the relationship between variables. Then made a correlation between gender and length of stay, correlation between age and lemgth of stay (los), correlation between secondary diagnosis and length of stay, correlation between surgery time and length of stay, correlation risk of surgery with length of stay, and correlation out patient condition with length of stay. In the analytic section tested by Chi-Square test and Fisher exact test. Significance if p-value <0.05.

RESULTS

Data collected from 419 subjects, fulfilling inclusion and exclusion criteria of the study.

From Table 1 can be seen the distribution of digestive surgical patient based on gender. The most digestive surgical patient was the man that is 238 patients (56.8%) and woman 181 patients (43.2%).

Table 1: Characteristics of patients.

Characteristics	N	%
Gender		
Man	238	56.8
Women	181	43.2
Age		
≤ 45 years	238	56.8
> 45 years	181	43.2
Diagnosis		
Without secondary diagnosis	244	58.2
With Secondary diagnosis	175	41.8
Surgery setting		
Emergency	179	42.7
Elective	240	57.3
Risk of surgery		
Low	31	7.4
Medium	51	12.2
High	199	47.5
Special	138	32.9
Out patient condition		
Improved	202	48.2
Healed	130	31.0
Not Healed	2	0.5
Died < 48 hours	9	2.1
Died > 48 hours	76	18.1
Length of Stay (LOS)		
≤ 9 Days	138	32.9
> 9 Days	281	67.1
Total	419	100

As seen in Table 1 the distribution of digestive surgical patient by age. Most of the gastrointestinal surgical patient is patient with age >45 years that is 244 patients (58.2%) while age ≤45tahun is 175 patients (41.8%). The distribution of digestive surgical patients based on secondary diagnosis. Most digestif surgical patient were those without a secondary diagnosis that is 244 patients (58.2%) while those with secondary diagnosis is 175 patients (41.8%). The distribution of digestive surgical patients based on surgery setting. Most digestive surgical patients are emergency patients that are 179 patients (42.7%), while the elective patients 240 patients (57.3%). The distribution of digestive surgical patients based on the risk of surgery. Most digestive surgical patients are large surgery group that is 199 patients (47.5%), followed by particular operation 138 patients (32.9%), while medium surgery group 51 patients (12.2%) and the least in the small surgery group 31 patients (7.4%). The distribution of digestive surgical patients based on outpatient condition. Mostly digestive surgical patients were with improved outcome that is 202 patients (48.2%), followed by healed outcome 130 patients (31.0%), died >48 hours 76 patients (18.1%) while patients died <48 hours 9 patients (2.1%), and the least patients with not healed condition that is only 2 patients (0.5%). The distribution of digestive surgical patients based on length of stay (LOS). The most digestive surgical patient is with the length of stay (LOS) >9 days that is 281 patients (67.1%) while with the length of stay (LOS) ≤nine days 138 patients (32.9%).

Table 2: Relation of gender and length of stay (LOS).

Gender	Length of Stay (LOS)				p
	≤ 9 Days		> 9 Days		
	N	(%)	N	(%)	
Man	79	33.2	159	66.8	0.917
Women	459	32.6	122	67.4	
Total	138	32.9	281	67.1	

Table 3: The relation between age and length of stay (LOS).

Age	Length of Stay (LOS)				p
	≤ 9 Days		> 9 Days		
	N	(%)	N	(%)	
≤45 years	65	37.1	110	62.9	0.140
>45 years	73	29.9	171	70.1	
Total	138	32.9	281	67.1	

Data on patients who have the longest day of treatment (LOS) >9 days is the man that is 159 patients (66.8%) and women 122 patients (67.4%). While patients who have a day of treatment (LOS) ≤nine days most of them are the man that is 79 patients (33.2%) and women 59 patients (32.6%). as shown in Table 2.

From table 3 obtained data that most patient which has the day of treatment (LOS) >9 days in patients with age >45 years that is 171 patients (70.1%) and patients with age ≤45 years 110 patients (62.9%). While patients with a length of stay (LOS) ≤nine days most of them are patients by the age >45 years that is 73 patients (29.9%) and patients with age ≤45 years 65 patients (37.1%). The result of this research is in line with the investigation of Wartawan WI (2012) which is obtained by the patient with day of treatment >9 days most of which are age >45 years, can be seen from the number of patients that is 442 (27.9%) while patient by the age ≤45 363 (22.9%).

Table 4: Relation between secondary diagnosis and length of stay (LOS).

Secondary Diagnosis	Length of Stay (LOS)				p
	≤ 9 Days		> 9 Days		
	N	(%)	N	(%)	
Without secondary diagnosis	101	41.4	143	58.6	0.000
With secondary diagnosis	37	21.1	138	78.9	
Total	138	32.9	281	67.1	

From Table 4 can be seen that most patient with the length of day (LOS) >9 days is patient without a secondary diagnosis that is 143 patients (58.6%) and patient with secondary diagnosis 138 patients (78.9%). While a most patient with the length of stay (LOS) ≤nine days is patient without a secondary diagnosis that is 101 patients (41.4%) and patient with secondary diagnosis 37 patients (21.1%).

Table 5: Relation between surgery setting and length of stay (LOS).

Surgery Setting	Length of Stay (LOS)				p
	≤ 9 Days		> 9 Days		
	N	(%)	N	(%)	
Emergency	78	43.6	101	56.4	0.000
Elective	60	25.0	180	75.0	
Total	138	32.9	281	67.1	

From Table 5 showed that most patient with the length of stay (LOS) >nine days patient with elective surgery that is 180 patients (75.0%), and patient with emergency surgery 101 patients (56.4%). Meanwhile most patient with the length of stay (LOS) ≤nine days patient with emergency surgery that is 78 patients (43.6%), and patient with elective surgery 60 patients (25.0%).

This result is in line with research by Wartawan WI (2012) which showed most patients with a length of stay >9 days are patients with elective surgery that is 658 patients (41.5%).

From Table 6 can be seen that most patient with length of stay (LOS) >9 days is patient in a big group that is 153 patients (76.9%), followed by particular group 99 patients (71.7%), small group 19 patients (61.3%), and medium group 10 patients (19.6%). Meanwhile, a most patient with the length of stay (LOS) ≤nine days is a large group that is 46 patients (23.1%), followed by medium group 41 patients (80.4%), particular group 39 patients (28.3%) and small group 12 patients (38.7%).

Table 6: Relation risk of surgery with length of stay (LOS).

Risk of Surgery	Length of Stay (LOS)				p
	≤ 9 Days		> 9 Days		
	N	(%)	N	(%)	
Small	12	38.7	19	61.3	0.000
Medium	41	80.4	10	19.6	
Large	46	23.1	153	76.9	
Special	39	28.3	99	71.7	
Total	138	32.9	281	67.1	

Table 7: Relation out patient condition with length of stay (LOS).

Out Patient Condition	Length of Stay (LOS)				p
	≤ 9 Days		> 9 Days		
	N	(%)	N	(%)	
Improved	59	29.2	143	70.8	0.000
Healed	47	36.2	83	63.8	
Not Healed	1	50	1	50.0	
Died < 48 hours	9	100	0	0.0	
Died > 48 hours	22	28.9	54	71.1	
Total	138	32.9	281	67.1	

From Table 7 can be seen that most patient with length of stay (LOS) >9 days is patient in improved group that is 143 patients (70.8%), followed by the healed group 83 patients (63.8%), the died >48 hours group 54 patients (71.1%), not treated group 1 patient (50.0%), and there is no in the died <48 hours group. Meanwhile most patient with length of stay (LOS) ≤9 days is in the improved group that is 59 patients (29.2%), followed by the healed group 47 patients (36.2%), the died >48 hours group 22 patients (28.9%), the died <48 hours group 9 patients (100.0%), and not healed group 1 patient (50.0%).

DISCUSSION

Based on the result of the bivariate analysis in table 8 it is known that there is no significant relationship between gender and the length of stay (LOS) in digestive surgical patients. Can be seen from p-value more than 0.05 (p = 0.917). These results are not in line with the study of Sasmita DE who said that there is a relation on gender factors in the characteristics of respondents with the length of stay moderate care Hospital of Ortopedi Prof. Dr. R. Soeharso Surakarta with the result correlation somer'd test p-value 0.036. Meanwhile according to Zhang J et al, length of stay can be influenced by two elements of patients sociodemography, which includes : age, gender, ethnicity, migration status, marital status, accommodation, and occupational status and clinical history of disease and severity of disease, diagnosis, mental examination (MSE), treatment, and score (HoNOS).[6,7]

Based on the result of bivariate analysis of the table 9 can be seen that there is no significant relationship between age and length of stay (LOS) of the digestive surgical patient. Can be seen from p-value more than 0,05 (p = 0.140).

This result is in line with the research by Yulfanita EA, which showed that there is no significant relationship between age and length of stay, with p-value = 0.386. The same result from research that is done by Wartawan EI which showed that there is no relation between age and length of stay. While the result from Pujianto IT (1996) showed that there is a significant relationship between age and length of stay (r-value = 0.34689).[8,9]

Meanwhile according to Afif et al, the greater the age of the patient it will require long days of treatment. The factor of age affects the length of stay. Elderly patients (over 45 years) tend to be longer to stay than younger patients. This is because in the elderly and increasing age, the working system of the body's vital organs decrease in work so that it can cause the immune system to decrease then result in immune system dysfunction that will affect the process of destruction of fungi and bacteria that enter the body.[10,11]

Based on the result of bivariate analysis in Table 10 showed that there is a significant relation between diagnosis and length of stay (LOS). Can be seen from p-value that is less than 0.05 (p = 0.000).

This research is in line with research by Perwira et al, which said that duration of treatment-related to the diagnosis, can be seen by the main diagnosis, secondary diagnosis, and complications.[12]

Research by Pujianto IT, which said that there is a relation between diagnosis and length of stay (value of x^2 = 98.252). Same result from Wartawan EI, which said that there is a very significant relationship between diagnosis and the p-value less than 0.005 (p=0.018).[8,13]

Based on the result of bivariate analysis Table 11 showed that there is a significant relationship between surgery setting and length of stay (LOS). Can be seen from p-value that less than 0.05 (p = 0.000).

This result is in line with research by Wartawan WI, which showed that there is a significant relationship between surgery setting and length of stay. Can be seen from p-value = 0.005 or less than 0.05. At the elective surgery, patients were well prepared, while at the emergency surgery, the preparation is not as well as the elective surgery, because with delayed surgery will endanger the patient's life. So with less than optimal preparation, especially on emergency surgery, the risk of wound infection becomes greater by Erbaydar et al.[8,14]

Based on the result of the bivariate analysis, table 12 showed that there is a significant relationship between risk of surgery and length of stay (LOS). Can be seen by p-value that less than 0.05 (p = 0.000).

Research from Ferreyra et al, which said that big group by using general anesthesia affect the occurrence of respiratory complications that ultimately extend the patient's length of stay. Similarly, the blood loss that occurs during the surgery also affects the length of stay of the patients.[1,15]

Based on the result of bivariate analysis Table 13 can be seen that there is a significant relation between outpatient condition and length of stay (LOS). Can be seen from p-value that is less than 0.05 (p = 0.000).

In this case, has not been obtained other significant studies on the relation between the length of stay (LOS) based on outpatient condition, so it can not be compared with other research. But the result of this study found a meaningful relation between outpatient status with the length of stay so that the result of this study can be used as a factor associated with the duration of treatment of the digestive surgical patients in Dr. Wahidin Sudirohusodo Hospital.

CONCLUSION

The study found a significant correlation between secondary diagnosis, length of surgery, the risk of operation, and outpatient condition with the length of stay. While no relationship between sex and age with the length of stay.

Recommendations

The study about factors related to the length of stay of digestive surgical patients, the researcher recommends that the hospital can reduce some factors that may make a longer duration of treatment, so the quality of the hospital services can increase.

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