

## Factors Length of Intensive Stay in Patients Post Gastro Intestinal Tract Operation

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### ABSTRACT

**Introduction:** Intensive care after gastrointestinal surgery is one of the factors that play an important role in caring patients with gastrointestinal disorders. Long treatment will have an impact on mortality and high treatment costs. The length of treatment can be caused by several factors, namely external factors and internal factors. External factors are nutritional status, type of surgery, and type of anesthesia. Meanwhile, internal factors are age, gender, amount of bleeding, incidence of infection and underlying disease.

**Objective:** Determine the factors associated with the length of intensive care in post-lower gastrointestinal tract surgery patients at Ibnu Sina YW UMI Makassar Hospital.

**Method:** Observational analysis with a cross-sectional method uses secondary data from the medical records data of patients treated in 2021 and 2022.

**Results:** From the data of 60 patients who met the inclusion criteria with patient descriptions: 56.6% adult age, 66.6% male gender, 83.3% type of operation found to be elective, 56.6% type of anesthesia without epidural, amount of bleeding <30% EBV was 83.3%, the incidence of infection was found to be 75%, good nutrition was 51.6%, the underlying disease was found to be malignant in 31.6%. Factors that influence the length of hospitalization are the amount of bleeding >30% EBV ( $p < 0.001$ ) and malnutrition nutritional status ( $p = 0.037$ ).

**Conclusion:** Factors associated with the length of intensive care in post-lower gastrointestinal tract surgery patients at Ibnu Sina YW UMI Makassar Hospital are the amount of bleeding >30% EBV and malnutrition nutritional status.

**Keywords:** Surgery; length of stay; gastrointestinal



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## Introduction

The length of treatment days for patients after laparotomy surgery is the number of days the patient is treated from the time, they undergo surgery until the patient is discharged home. The length of treatment will depend on the nutritional status and health condition of the patient. These circumstances and conditions are influenced by several factors. The length of treatment is caused by several factors, namely external factors and internal factors. External factors include adequate nutritional intake, technique during surgery, medication consumed, and wound management. Meanwhile, internal factors are age, circulation disorders, pain and comorbidities.<sup>1</sup>

The human digestive system plays a role in taking in food, digesting it for energy, absorbing nutrients and removing digestive waste. The digestive system plays an important role in providing nutrition and energy for the body.<sup>2</sup>

WHO data shows that surgical care has been an important part of health care worldwide for more than a hundred years. It is estimated that 230 million surgical procedures are carried out every year throughout the world.<sup>3</sup> Based on national table data from the Ministry of Health of the Republic of Indonesia, surgical procedures are known to rank 11th in Indonesia with a percentage of 12.8% and 32% of them are laparotomy.<sup>4</sup>

Surgery or surgery is any treatment action that uses an invasive method by opening or exposing the part of the body to be intervened, generally, this action is carried out by making an incision which ends with closing and suturing the wound. Surgery is performed for several reasons, such as diagnostic (biopsy, exploratory laparotomy), curative (excision of the tumor mass, removal of the inflamed appendix), reparative (repairing multiple wounds), reconstructive and palliative.<sup>5</sup>

Based on the results of the discussion, the author is interested in conducting this research because the number of surgical procedures has a fairly high percentage, based on WHO data there are 230 million surgical procedures each year and for Indonesia, the percentage is quite high, namely 12.8%. The results of this data will have an impact on the length of treatment required for the patient. The higher the number of operations, the higher the population of hospital stays. The author is interested in conducting this research in addition to finding out what factors influence the length of post-operative patient care.

## Methods

This research uses an analytical observational method with a cross-sectional approach, where variables are measured simultaneously. This research was conducted at the Ibnu Sina YW UMI Makassar Hospital. Sampling was carried out by looking at the patient's complete medical records in the medical records room, using a sample of 60 people. The research time schedule is from August to September

2023. The research sample calculation uses the Slovin formula.

## Result

This study aims to determine the relationship between length of stay and post-lower gastrointestinal tract surgery patients.

Annalistic Univariate:

**Table 1. Age Frequency Distribution Based on Sample**

Age	n	%
Adolescent	6	10,00
Adult	34	56,66
Elderly	20	33,33
Total	60	100,00

Shows the distribution of samples based on age, the majority of samples are adults, namely 56,66%.

**Table 2. Gender Frequency Distribution Based on Sample**

Gender	n	%
Male	40	66,66
Female	20	33,33
Total	60	100,00

Shows the distribution of the sample based on gender, the majority of the sample is male, namely 66,66%.

**Table 3. Type of Operation Frequency Distribution Based on Sample**

Type of Operation	n	%
Emergency	10	16,66
Elective	50	83,33
Total	60	100,00

Shows the distribution of the sample based on the type of operation, the majority of the sample is in the elective surgery type category, namely 83,33%.

**Table 4. Type of Anesthesia Frequency Distribution Based on Sample**

Type of Anesthesia	n	%
Anesthesia With Epidural	26	43,33
Anesthesia Without Epidural	34	56,66
Total	60	100,00

Shows the distribution of samples based on the type of anesthesia, the majority of samples have the type of anesthesia category without epidural anesthesia technique, namely 56,66%.

**Table 5. Amount of Bleeding Frequency Distribution Based on Sample**

Amount of Bleeding	n	%
≤30% EBV	50	83,33
>30% EBV	10	16,66
Total	60	100,00

Shows the distribution of samples based on the amount of bleeding, where the majority of samples did not experience bleeding (≤30% EBV), namely 83,33%.

**Table 6. Infection Frequency Distribution Based on Sample**

Infection	n	%
Infection	45	75,00
Not Infected	15	25,00
Total	60	100,00

Shows the distribution of samples based on infection, where the majority of samples experienced infection, namely 75,00%.

**Table 7. Nutritional Status Frequency Distribution Based on Sample**

Nutritional Status	n	%
Good Nutrition	31	51,66
Malnutrition	29	48,33
Total	60	100,00

Shows the distribution of samples based on nutritional status, where the majority of samples have good nutritional status, namely 51,66%.

**Table 8. Underlying Disease Frequency Distribution Based on Sample**

Underlying Disease	n	%
Congenital	10	16,66
Infection	13	21,66
Trauma	18	30,00
Malignancy	19	31,66
Total	60	100,00

Shows the distribution of samples based on the underlying disease, where the majority of samples are in the malignancy category, namely 31,66%.

**Table 9. Length of Stay Frequency Distribution Based on Sample**

Length of Stay (Days)	n	%
1-3	24	40,00
4-6	33	55,00

7-10	3	5,00
<b>Total</b>	<b>60</b>	<b>100,00</b>

Shows the distribution of samples based on length of stay, where most of the samples were treated for 4-6 days, namely 55,00%.

**Table 10. Summary of Sample Characteristics (n = 60)**

Variable	Key Categories	Percentage (%)
<b>Age</b>	Adult	56.7
	Elderly	33.3
	Teenager	10.0
<b>Gender</b>	Male	66.7
	Female	33.3
<b>Operation Type</b>	Elective	83.3
	Emergency	16.7
<b>Anesthesia Type</b>	Without Epidural	56.7
	With Epidural	43.3
<b>Bleeding Amount</b>	≤30% EBV	83.3
	>30% EBV	16.7
<b>Infection</b>	Infected	75.0
	Not Infected	25.0
<b>Nutrition</b>	Good Nutrition	51.7
	Malnutrition	48.3
<b>Underlying Disease</b>	Trauma/Malignancy (combined)	61.7
	ongenital/Infection (combined)	38.3

Annalistic Bivariate:

**Table 11. Analysis of the Relationship between Age and Length of Hospitalization for Patients Post-Lower Gastrointestinal Surgery in the ICU at Ibnu Sina Hospital YW UMI Makassar**

Length of Stay (Days)	Tota	p-value
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			1-3	4-6	7-10	
Age	Adolescent	n	2	4	0	6
		%	33,33	6,66	0,00	100,00
	Adult	n	10	22	2	34
		%	29,41	64,70	5,88	100,00
	Elderly	n	12	7	1	20
		%	60,00	35,00	5,00	100,00
Total	n	24	33	3	60	
	%	40,00	55,00	5,00	100,00	

This is the result of the chi-square test, where a p-value of 0,23 (>0,05) was obtained, which means there is no significant relationship between age and the length of stay for patients after lower gastrointestinal surgery.

**Table 12. Analysis of the Relationship between Gender and Length of Hospitalization for Patients Post-Lower Gastrointestinal Surgery in the ICU at Ibnu Sina Hospital YW UMI Makassar**

			Length of Stay (Days)			Total	p-value
			1-3	4-6	7-10		
Gender	Male	n	18	19	3	40	
		%	45,00	47,50	7,50	100,00	
	Female	n	6	14	0	20	
		%	30,00	70,00	0,00	100,00	
Total	n	24	33	3	60		
	%	40,00	55,00	5,00	100,00		

This is the result of the chi-square test, where a p-value of 0,17 (>0,05) was obtained, which means there is no significant relationship between gender and the patient's length of stay after lower gastrointestinal surgery.

**Table 13. Analysis of the Relationship between Type of Operation and Length of Hospitalization for Patients Post-Lower Gastrointestinal Surgery in the ICU at Ibnu Sina Hospital YW UMI Makassar**

			Length of Stay (Days)			Total	p-value
			1-3	4-6	7-10		
Type of Operation	Emergency	n	6	4	0	10	
		%	45,00	47,50	7,500	100,00	
	Elective	n	18	29	3	50	
		%	30,00	70,00	0,00	100,00	
Total	n	24	33	3	60		
	%	40,00	55,00	5,00	100,00		

This is the result of the chi-square test, where a p-value of 0,31 (>0,05) was obtained, which means there is no significant relationship between the type of surgery and the length of stay for patients after lower gastrointestinal surgery.

**Table 14. Analysis of the Relationship between Type of Anesthesia and Length of Hospitalization for Patients Post-Lower Gastrointestinal Surgery in the ICU at Ibnu Sina Hospital YW UMI Makassar**

		Length of Stay (Days)			Total	p-value
		1-3	4-6	7-10		
Type of Anesthesia	Anesthesia with Epidural	n	14	10	2	26
		%	53,84	38,42	7,62	100,00
	Anesthesia without Epidural	n	10	23	1	34
		%	24,00	33,00	3,00	100,00
Total		n	24	33	3	60
		%	40,00	55,00	5,00	100,00

This is the result of the chi-square test, where a p-value of 0,07 (>0,05) was obtained, which means there is no significant relationship between the type of anesthesia and the patient's length of stay after lower gastrointestinal surgery.

**Table 15. Analysis of the Relationship between Amount of Bleeding and Length of Hospitalization for Patients Post-Lower Gastrointestinal Surgery in the ICU at Ibnu Sina Hospital YW UMI Makassar**

		Length of Stay (Days)			Total	p-value
		1-3	4-6	7-10		
Amount of Bleeding	<30% EBV	n	22	28	0	50
		%	44,00	56,00	0,00	100,00
	>30% EBV	n	2	5	3	10
		%	20,00	50,00	30,00	100,00
Total		n	24	33	3	60
		%	40,00	55,00	5,00	100,00

This is the result of the chi-square test, where a p-value of <0,00 (<0,05) was obtained, which means there is a significant relationship between the amount of bleeding and the patient's length of stay after lower gastrointestinal surgery.

**Table 16. Analysis of the Relationship between Infection and Length of Hospitalization for Patients Post-Lower Gastrointestinal Surgery in the ICU at Ibnu Sina Hospital YW UMI Makassar**

		Length of Stay (Days)			Total	p-value
		1-3	4-6	7-10		
Infection	Infection	n	21	21	3	45
		%	46,67	46,66	6,66	100,00
	Not Infected	n	3	12	0	10
		%	20,00	80,00	0,00	100,00
Total		n	24	33	3	60
		%	40,00	55,00	5,00	100,00

This is the result of the chi-square test, where a p-value of 0,07 (>0,05) was obtained, which means there is no significant relationship between infection and the patient's length of stay after lower gastrointestinal surgery.

**Table 17. Analysis of the Relationship between Nutritional Status and Length of Hospitalization for Patients Post-Lower Gastrointestinal Surgery in the ICU at Ibnu Sina Hospital YW UMI Makassar**

		Length of Stay (Days)			Total	p-value
		1-3	4-6	7-10		
Nutritional Status	Good Nutrition	n	8	22	1	31
		%	28,80	70,96	3,22	100,00
	Malnutrition	n	16	11	2	29
		%	55,17	37,93	6,89	100,00
Total		n	24	33	3	60
		%	40,00	55,00	5,00	100,00

This is the result of the chi-square test, where a p-value of 0,03 (<0,05) was obtained, which means there is a significant relationship between nutritional status and the patient's length of stay after lower gastrointestinal surgery.

**Table 18. Analysis of the Relationship between Underlying Disease and Length of Hospitalization for Patients Post-Lower Gastrointestinal Surgery in the ICU at Ibnu Sina Hospital YW UMI Makassar**

		Length of Stay (Days)			Total	p-value
		1-3	4-6	7-10		
Underlying Disease	Congenital	n	1	9	0	10
		%	10,00	90,00	0,00	100,00
	Infection	n	5	8	0	13
		%	29,41	64,70	5,88	100,00
	Trauma	n	7	10	1	18
		%	38,88	55,55	5,55	100,00
	Malignancy	n	11	6	2	19
		%	57,89	31,57	10,52	100,00
Total		n	24	33	3	60
		%	40,00	55,00	5,00	100,00

This is the result of the chi-square test, where a p-value of 0,11 (>0,05) was obtained, which means there is no significant relationship between the underlying disease and the patient's length of stay after lower gastrointestinal surgery.

## Discussion

The results of this study show that 2 (33.3%) patients in adolescents had a length of stay of 1-3 days, 4 (6.6%) patients had a length of stay of 4-6 days, 0 patients had a length of stay of 7-10 days. (0%) patients, Meanwhile, 10 (29.4%) patients were adults who had a length of stay of 1-3 days, 22 (64.7%) patients had a length of stay of 4-6 days, a length of stay of 7-10 days as many as 2 (5.8%) patients, while

elderly patients who had a length of stay of 1-3 days were 12 (60%) patients, a length of stay of 4-6 was 7 (35%) patients, a length of stay of 7-10 days as many as 1 (5%) patient. Based on the chi-square test, the p-value was 0.235 ( $>0.05$ ), indicating no statistically significant association between patient age and length of stay following lower gastrointestinal surgery.

This is in line with research conducted by El Rahmayati (2017). The results of this study showed that post-operative patients aged more than 45 years were more likely to have a hospital stay of more than 5 days in the surgical inpatient room. The results of statistical tests using chi-square can be obtained, namely  $\rho$  value=0.636, which means  $\rho > \alpha$ , therefore, it can be concluded that there is no relationship between the age of the patient and the length of post-operative patient care in the surgical inpatient room at Dr. Hospital. H Abdul Moeloek.<sup>6</sup>

Respondents whose age is less than 45 years physiologically will recover faster than respondents who are more than or 45 years old. As age increases, a person's immune system's ability to destroy bacteria and fungi decreases. Immune system dysfunction may be thought to be a factor in the development of the disease. Not only does it depend on the age of the respondent, but different lifestyle patterns can also influence the length of treatment. For this reason, it is hoped that in carrying out health tasks for respondents the process remains in following the same procedures, functions and objectives even though the treatment remains different so that respondents of all ages can be treated at the right time according to their age criteria.<sup>7</sup>

The results of this study showed that 18 (45%) male patients had a length of stay of 1-3 days, 19 (47.5%) patients had a length of stay of 4-6 days, 3 (7.5%) patients, had a length of stay of 7-10 days. While female patients had a length of stay of 1-3 days as many as 6 (30%) patients, a length of stay of 4-6 as many as 14 (70%) patients, a length of stay of 7-10 days as many as 0 (0%) patients, therefore, a p-value was obtained of 0.235 ( $>0.05$ ), which means there is no significant relationship between gender and the patient's length of stay after lower gastrointestinal surgery.

This is in line with research conducted by Cipto Siswoyo (2020). There were no significant differences in gender, namely that the research sample included almost the same number of men and women (57% and 43%). In the field of general surgery, research shows conflicting findings regarding gender disparities. For example, women are less likely than men to be diagnosed with colon cancer through screening however, women also have faster rates of surgery despite higher rates of multi-visceral resections in other areas of elective general surgery, women are less likely to undergo surgical inguinal hernia repair. Laparoscopy than men in elective surgical settings.<sup>8</sup>

The results of this study show that 6 (45%) patients with emergency surgery had a length of stay of 1-3 days, 4 (47.5%) patients had a length of stay of 4-6 days, 0 (7.5%) patients, had a length of stay of 7-10 days. While patients with elective surgery who had a length of stay of 1-3 days were 18 (30%) patients,

a length of stay of 4-6 was 29 (70%) patients, a length of stay of 7-10 days was 3 (0 %) patients, the results obtained from the chi-square test calculation were 0.318 ( $>0.05$ ), which means there is no significant relationship between the type of operation and the length of stay for patients after lower gastrointestinal surgery.

This is not in line with research conducted by El Rahmayati (2017) showing that the majority of respondents had a length of stay of more than 5 days with emergency surgery as many as (76.9%) of the respondents. The results of this study showed that post-operative patients who had emergency surgery were more likely to have a hospital stay of more than 5 days in the surgical inpatient room. The results of statistical tests using chi-square can be obtained from the value  $\rho$  value=0.024 which means  $\rho < \alpha$ , so it can be concluded that there is a relationship between the type of operation and the length of post-operative patient care in the surgical inpatient room at Dr. Hospital. H Abdul Moeloek. Several patients had undergone surgery due to emergency surgical cases were transferred to the ward during follow-up post-operative care. Thus, some of these patients do not need a long time to undergo treatment in the room, because the operation has already been completed and does not cause post-operative problems.<sup>6,9</sup>

The results of this study show that 14 (53.8%) patients had an epidural anesthesia technique, 10 (38.4%) patients had a length of stay of 4-6 days, and a length of stay of 7-10 days. 2 (7.6%) patients, while 10 (24%) patients had a length of stay of 1-3 days without epidural anesthesia technique, 23 (33%) patients had a length of stay of 4-6 days, a length of stay of 7-10 days for 1 (3%) patient. Thus, the results obtained from the chi-square test calculation were 0.076 ( $>0.05$ ), which means there is no significant relationship between the type of anesthesia and the length of stay for patients after lower gastrointestinal surgery.

This is in line with research conducted by Cipto Siswoyo (2020) where the results of the study partially show that the variable length of treatment in RR and hypothermia influence the dependent variable (increased costs), while the variables BMI, duration of operation and type of anesthesia do not have a direct effect on increased maintenance costs in the recovery room. This is indicated by the significance value for the variables BMI = 0.948, length of operation = 0.661, length of treatment = 0.000, type of anesthesia = 0.066, and hypothermia = 0.000 so that the significance value for all independent variables is  $<0.05$ . Based on the results of the beta coefficient (B) value which explains that the dependent variable will change if the independent variable is changed by 1 unit, thus, it can be concluded that in column B the highest value is the incidence of hypothermia so that the incidence of hypothermia is the most dominant factor influencing the length of stay. Clinical trials to determine the outcome have shown conflicting results, mainly because the number of patients studied was too small, and the factors that influenced the outcome (eg, type of surgery, American Society of Anesthesiologists [ASA] physical status

classification, age, gender and, Goldman Risk Index) is not well controlled.<sup>8,10</sup>

The results of this study showed that patients with bleeding <30% EBV with a length of stay of 1-3 days were 22 (44%) patients, a length of stay of 4-6 days was 28 (56%) patients, a length of stay of 7-10 days was 0 (0%) patients, Meanwhile patients who had bleeding >30% EBV with a length of stay of 1-3 days were 2 (20%) patients, a length of stay of 4-6 days was 5 (50%) patients, a length of stay of 7-10 days as many as 3 (5%) patients, so that the results obtained from the chi-square test calculation were <0.001 (<0.05), which means there is a significant relationship between post-gastrointestinal bleeding and length of stay.

This is in line with research conducted by Hebert J (2019) where it was found that 7 patients (2.3%) experienced post-operative bleeding. The average length of hospital stay before discharge was 12 days (median=13 days). The results of this study are not supported by the reality in the field that the more bleeding that affects hemoglobin levels, whether caused by trauma or the method and length of operation, the longer the patient's hospitalization period.<sup>11,12</sup>

The results of this study showed that 21 (46.6%) patients with infections had a length of stay of 1-3 days, 21 (46.6%) patients had a length of stay of 4-6 days, 3 (46.6%) had a length of stay of 7-10 days. 6.6%) patients, while patients with no incidence of infection had a length of stay of 1-3 days as many as 3 (20%) patients, a length of stay of 4-6 as many as 12 (80%) patients, a length of stay of 7-10 days as many as 0 (0%) patients, so that the results obtained from the chi-square test calculation were <0.072 (>0.05), which means there is no significant relationship between infection and the length of stay for patients after lower gastrointestinal surgery.

This research is in line with research conducted by El Rahmayati (2017). The results of research on post-operative patients who did not have surgical wound infections were more likely to have a hospital stay of more than 5 days in the surgical inpatient room. The results of statistical tests using chi-square obtained a value of  $\rho$  value=0.114, which means  $\rho > \alpha$ , so it can be concluded that there is no relationship between surgical wound infection and the length of post-operative patient care in the surgical inpatient room at Dr. Hospital. H Abdul Moeloek. The incidence of no wound infections occurred due to aseptic measures and good and correct care at the time, so the incidence of surgical wound infections was less among respondents compared to respondents who experienced surgical wound infections.<sup>6</sup>

The results of this study showed that 8 (28.8%) patients had a good nutritional status, 22 (70.9%) patients had a length of stay of 1-3 days, 22 (70.9%) patients had a length of stay of 4-6 days, and a length of stay of 7-10 days. 1 (3.2%) patient, while patients with poor nutritional status who had a length of stay of 1-3 days were 16 (55.1%) patients, a length of stay of 4-6 was 11 (37.9%) patients, a long stay of 7-10 days for 2 (6.8%) patients. Therefore, the results obtained from the chi-square test calculation were <0.037

(<0.05), which means there is a significant relationship between nutritional status and the length of stay for patients after lower gastrointestinal surgery.

This research is in line with research conducted by Laila Sholehah (2021) that patients with good nutritional status will lead to faster recovery and healing of wounds and prevent complications thus, the patient's length of stay will be shorter. Wound healing requires nutrients such as protein and zinc. If the patient has poor nutrition (malnutrition), these nutrients will not be sufficient, which can delay process of wound-healing. This can cause the wound resulting from the incision not to close completely, which can cause secondary infections and even bleeding, which can be a complication for wound healing.<sup>1,13</sup>

The results of this study show that 1 (10%) patients with congenital diseases had a length of stay of 1-3 days, a length of stay of 4-6 was 9 (90%) patients, a length of stay of 7-10 days was 0 (0%) patients, while patients with underlying infectious diseases had a length of stay of 1-3 days as many as 5 (29.4%) patients, a length of stay of 4-6 as many as 8 (64.7%) patients, a length of stay of 7-10 days as many as 0 (0%) patients, while patients with underlying trauma conditions had a length of stay of 1-3 days as many as 7 (38.8%) patients, a length of stay of 4-6 as many as 10 (55.5%) patients, a length of stay of 7-10 days as many as 1 (5.5%) patient, while patients with underlying malignancies who had a length of stay of 1-3 days were 11 (57.8%) patients, a length of stay of 4-6 as many as 6 (31.5%) patients, long treated 7-10 days for 2 (10.5%) patients. Therefore, the results obtained from the chi-square test calculation were 0.111 (>0.05), which means there is no significant relationship between the underlying disease and the length of stay for patients after lower gastrointestinal surgery.

This research is in line with research conducted by Suci Nurjannah (2019). The average length of stay for children who have no history of illness or comorbidities is 3.34 days. The statistical test results obtained a p-value = 0.178, meaning  $\alpha > 0.05$ . This analysis also explains that there is no relationship between disease history and length of stay. Respondents with cases of acute illnesses and chronic illnesses will require different lengths of stay, the chronic cases will require longer care days than acute cases. Most of the respondents who were treated used health insurance which had a predetermined length of stay for each particular disease could influence the patient's length of stay.<sup>14,15</sup>

## Conclusion

Based on research on factors related to length of intensive care in post-lower gastrointestinal tract surgery patients at Ibnu Sina YW UMI Makassar Hospital, it was concluded that age, gender, type of operation, type of anesthesia, infection and underlying disease were not related to length of stay. Meanwhile, the number of bleeding factors that are >30% EBV and malnutrition are related to the length

of intensive care for post-lower gastrointestinal tract surgery patients at Ibnu Sina YW UMI Makassar Hospital.

### Conflicts of Interest

The author declares there is no conflict of interest with the parties involved in this research.

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