Factors Affecting Patients' Length of Stay in Intensive Care Unit Post Abdominal Surgery

*Aya Metwally Abdelgaffar, ** Sarah Fathy Mahmoud, *** Eman Mohamed Farag

*Nursing supervisor in elsaff general hospital, **Assistant Professor of Critical Care & Emergency Nursing, *** Lecture of Medical Surgical Nursing Faculty of Nursing- Ain Shams University, Egypt

Abstract

Background: After abdominal surgery a significant number of patient require admission to intensive care unit for close monitoring and specialized care. .Aim of the study: was to assess factor affecting patients' length of stay in intensive care unit post abdominal surgery. Design: A descriptive exploratory design was utilized in this study. Subject: A purposive sample of 80 conscious patients was recruited in this study. Setting: ICU In El Saff general hospital Giza, Egypt. Tool of data Collection: Tool I- Structural interview questionnaire, Tool II: Factor affecting Patients' length of Stay in Intensive Care Unit Post Abdominal Surgery, Tool III: postoperative wound care assessment. Result: indicated abdominal surgery was 55% among male patient's in age group 40<60 years old, 72.5% of the studied patient suffered from chronic disease, 60% of them had moderate pain and 27.5% of them had severe pain. There was positive statistically correlation between total postoperative wound care assessment and numerical pain rate among studied patient's post abdominal surgery at (p<0.001*). Conclusion: There were many factors affecting length of stay among the patient post abdominal surgery in ICU including; demographic data, medical data, physiological factors in addition to pain intensity and wound care assessment. **Recommendation**: Designing health educational program for patient undergoing abdominal surgery to enhance their health outcome.

Key words: Factors affecting length of stay, Intensive care unit, post abdominal surgery.

Introduction

Patient at the postoperative phase are in a risk state and require constant awareness and assessment that can only be achieved with effective health care provider. The majority of patient after major abdominal surgery is nowadays require fixed component а of postoperative pathways through intensive care unit (ICU). Abdominal surgery was performed for older and multimorbid patients has led to an increase in the demand for critical care services and to an increase in the postoperative ICU length of stay (LOS) (Kang et al., 2021).

The most common indications for surgical abdominal intervention: including a wide range of both elective and emergency operational procedures such as (cholecystitis ,hernia repair, and gastrointestinal surgeries, bowel obstruction). The purpose of surgical abdominal intervention is to correct the health problems and avoid unnecessary complications . After abdominal surgery a significant number of patients require admission to the Intensive Care Unit (ICU) for close monitoring and specialized care (Patterson et al., 2022).

The length of stay in the ICU is important in term of quality of patient care. It is vary widely among patients postoperative abdominal surgery based on several factor such as; the type of the primary disease of the patient .It ranges between 7and21days.On the other hand about 9% of all patients post abdominal surgery require maximum of 14days in ICU .Hospital stay has been shown to be the signal stronger predictor of direct cost and account for 31-68% of the total variation in the hospital costs. Prolonged ICU stay is associated with higher mortality and a poorer long term survival (Thikom et al., 2021).

According to (Stefanita et al., 2021) it has been reported a number of factors that affecting length of hospitalization for patients with acute abdominal surgery in ICU are include : personal data (agegender level of education- marital statuswork), medical data as (past & present medical data-surgical history- family history), as well as physiological factor concerning with ((respiratory rate, oxygenation, pulse, mean blood pressure, temperature, arterial blood potential of hydrogen (ph), serum sodium, serum potassium, serum creatinine, hematocrit, white blood cell, Glasgow coma scale). In addition to wound care assessment for surgical incision site for patient post abdominal surgery is consider important factor that influence the length of stay in the ICU after abdominal surgery that can provider help healthcare optimize patients' care and improve clinical outcome (Joo et al., 2022).

One of the most important responsibilities of the nurse is the care of patients after surgical procedures .In the ICU, nurses play a crucial role in caring for patients who have undergone post abdominal surgery through providing comprehensive nursing care, closely monitoring patients' conditions. and ensuring their recoverv progresses smoothly. key aspects of the nursing role caring patient post abdominal surgery involved (assessment and monitoring, pain management, wound care. medication administration, mobilization and early ambulation. nutritional management, emotional and educational support) (Dikmen et al., 2022).

Significance of the study

Postoperative complications are an important health problem that causes approximately 3 million death each year worldwide, thus representing one of the leading causes of patient mortality. Accordingly, the admission to the ICU of high-risk surgical patients historically has been regarded as vital prolonged stay in ICU is associated with high mortality risk and serious resource consumption. Globally, the mortality rate is higher than 40% in patients who have ICU stay longer than 14 days. On other hand decrease LOS in ICU among patient post abdominal surgery lead to decrease mortality & morbidity rate, risk of hospital infection and hospitalization cost for both patient and hospital (Moreno et al., 2019). So that the study aim to assess patient who underwent abdominal surgery ,followed up in ICU and to determine the medical &physiological factor affecting prolonged stay.

Aim Of The Study

This study aims to assess factors affecting Patients' length of stay in intensive care unit post abdominal surgery through the following:

 Assessment patient's demographic data that affecting Patients' length of stay in the intensive care unit post abdominal surgery.

- Assessment medical factors influencing patient's length of stay post abdominal surgery in the intensive care unit
- Assessment physiological factor's influencing patient's length of stay post abdominal surgery in the intensive care unit.

Research Question:

The current study will answer the following question.

What are the factors influencing Patient's length of stay post abdominal surgery in intensive care unit? **Operational Definition:**

Length of stay: is a term to describe the duration of a single episode of hospitalization .in patient day are calculated by subtracting day of admission from day of discharge

Subject And Methods

Research Design:

A descriptive exploratory research design was utilized to achieve the aim of this study, which involves observing and collecting data on a given topic without attempting to interfere with cause and affect relation. It aimed to describe the correlations, patterns, and trends observed in the collected data as well as to provide a complete and accurate picture of the patient under study (Sun et al., 2023).

Setting:

This study was conducted at surgical intensive care unit of EL-Saff general hospital, in Egypt; it located at the second floor in EL-Saff general hospital consists of three rooms and each room divided into separate section containing 12 beds. Moreover, the intensive care unit has 12 staff nurses and 2 head nurses distributed equally between night and day shifts. The surgical ICU provides care for different categories of critically ill patients who need comprehensive stabilization. On average 84 patients are admitted every month. Around 12 patients are receiving care in ICU every day.

Subject:

A purposive sample of eighty adult, conscious patient were recruited for the conduction of this study. The study sample was selected according to the following criteria: Adult patients from both gender, admitted to ICU post abdominal surgery for the first time, able to comprehend instructions and patients from free mental and psychiatric disturbance. According to the total patients who were admitted to the surgical intensive care unit post operation at EL-Saff general hospital, throughout the year of 2022. Their total number is 1000 patients according to the (statistical record of EL-Saff general hospital, 2022) and based on the following equation: 2

$$n = \left(\frac{Z_{1-\alpha/2} + Z_{1-\beta}}{ES}\right)^2$$

n= Sample size

z = Class standard corresponding to the level of significance equal to 0.95 and 1.96 The standard normal deviate for $\alpha = Z$ =

The standard normal deviate for $\alpha = Z_{\alpha} = 1.960$

The standard normal deviate for $\beta = Z_\beta = 0.842$

A = 2.500 B = $(Z_{\alpha}+Z_{\beta})^2 = 7.849$ C = $(E/S(\Delta))^2 = 0.1024$ AB/C = 76.6491. n = 80n = $(\frac{1.96+0.84}{0.1024})^2 = 76.6491 \approx 80$ patients

Inclusion criteria of patients:

The study sample will be selected according to the following criteria: Adult patients from both gender, admitted to ICU post abdominal surgery for the first time and able to comprehend instructions.

Exclusion criteria: Patients with mental and psychiatric disturbance.

Tools for data collection: Tool I: Structured interviewing questionnaire of patient's post abdominal surgery (Appendix I):

This tool was developed by the researcher it consisted of two parts:

• **Part 1**: Demographic data of the patient's: this part was used to assess patient (age, gender, level of education, marital status, occupation).

• Part 2: patients' medical data ;

This part was designed by the researcher to assess:

Present medical history such as (chief complaint /associated signs and symptoms, onset of the disease, type of allergy, length of stay in ICU). Past medical history such as (suffering from any chronic disease, such as diabetes mellitus, hypertension and cardiovascular disease....etc). Surgical history such as (current surgery, type of anesthesia). Family medical history such as (family member suffer from chronic disease and relation).

II: Factor affecting Patients' length of Stay in Intensive Care Unit Post Abdominal Surgery (Appendix II): It is consists of two parts:

Part I: Acute physiology and chronic health evaluation (A patch II): it was a standardized tool adapted from (Knaus et al., 1985) to assess physiological factors that affect patient length of stay in intensive care unit post abdominal surgery it consisted of (12) items as regard modification by the investigator to eight items including (body temperature, mean blood pressure, pulse, respiratory rate, oxygen saturation, arterial blood pressure, serum electrolyte, complete blood count).Excluded point of Glasgow coma scale because I studied on conscious patients and excluded the point of age because it was measured in demographic data

Scoring system:

Each item answered by the investigator from the patient file using three classification which were1-with normal range 2- below normal range 3- above normal range.

Part II: The Numerical Pain Rating Scale (NPRS);

This part is adopted from (Stallings et al., 2024). It was availd tool used to assess the level of pain among patients post abdominal surgery in ICU.

Scoring system;

The total score is classified as: no pain =zero, mild pain ranging from 1-3, moderate pain ranging from 4-6 and sever pain ranging from 7-10 degree.

Tool III: wound care assessment tool: This tool was adopted from (Natvns, 2021), it was used to assess wound characteristic after postoperative patient's consisted of, thirteen items; (size, depth, edges, under mining, necrotic tissue type, necrotic tissue amount, exudate type, exudate amount, skin color surrounding wound, peripheral tissue edema, peripheral tissue induration, granulation tissue and epitheliazation)

Scoring system: Wound care assessment include thirteen items, each item have five categories ranged from 1 to 5 degree. The total degree was calculated and classified as following;

• From one to thirteen was considered (health tissue).

- Above thirteen to sixty was considered (wound regeneration).
- Above sixty to sixty-five was consider (wound degeneration).

Operational design;

The operational design included preparatory phase, ethical consideration, validity, reliability, pilot study and field work and limitation of the study.

Preparatory phase:

It include reviewing of the related literature and theoretical knowledge of various aspects of the study using books, articles ,internet periodicals and magazines be acquainted with research problem and to develop study tools.

Validity and reliability:

The validity of the developed tools was tested using (face and content validity). Face validity aimed to inspect the items to determine whether the tools appropriate. while measured were content validity was done to determine what is supposed to measure whether the tool achieved the study aim .The validity was tested through a jury of five experts (two professor ,two assistant professor and one lecture) in the field of critical care nursing, faculty of nursing, Ain shams university who reviewed the content of the tools for comprehensiveness, accuracy, clarity and relevance and necessary modification was done accordingly. The reliability of the study tools was tested statistically using Cronbach's alpha. For assessment factors affecting length of stay was (0.789) indicated high reliability of this tool

Ethical Consideration:

The ethical approval was obtained from the research ethical committee in the faculty of Nursing- Ain Shams University before starting the study. The researcher assured maintaining anonymity and confidentiality of subjects' data. The researcher clarified the objective and aim of the study to the patient included in the study. Patients were informed that they are allowed to choose to participate or not in the study and that they have the right to withdraw from the study at any time without any penalty.

Administrative design:

Approval to conduct the research was obtained through a letter addressed from the dean of the faculty of nursing Ain Shams University to the director of El staff general hospital at which the study was conducted explaining the purpose of the study and requesting the permission for data collection. An official permission was obtained from director in which the study was conducted

Pilot study:

A pilot study was carried out on ten patients from the study subjects to test the clarity, applicability, feasibility and relevance of the tools used and to determine the time needed for the completion of the study tools. The patients who were included in the pilot study were included to the sample because no modification was done after conducting pilot study.

Field work:

To carry out the study, an approval was obtained from the hospital director at El staff hospital .A letter was issued to them from the faculty of nursing, Ain Shams University explained the aim of the study in order to obtain permission and cooperation to conduct study. The purpose of the study was simply explained to the participants who agreed

prior to data collection .The sample of the study was recruited according to the inclusion criteria. Data were collected through 5 month, from beginning of May 2024 to the end September 2024. The researcher visited the study setting two days per week (Sunday, Thursday) at morning and afternoon shift. the researcher collected the data from (2-3) patients per day . The researcher started assessment of patients by assessing patient demographic and medical data by using structured interviewing questionnaire, it look about 30 minutes to be fulfilled then the researcher assessed acute physiology and chronic health evaluation (APATCHE II) from patient post abdominal surgery in ICU, it took about 20-30 minute then assessed numerical pain rating scale, it took about 1 minute to be filled. Finally the researcher assessed characteristic of wound through wound care assessment tool which took about 10 minute to be filled.

Statistical analysis:

Recorded data were analyzed using the statistical package for social sciences, version (28).Quantitative data were expressed as mean \pm standard deviation (SD). Qualitative data were expressed as frequency and percentage. The following tests were done:

- The Chi-square test was used to compare between qualitative data.
- Pearson's correlation coefficient (r) test was used to assess the degree of association between two sets of variables.

The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered significant as the following:

Probability (P-value)

- P-value ≤ 0.05 was considered significant.
 P-value > 0.05 was considered
- insignificant.

Results

Table (1) Indicated that, 45.0% of the studied patients were aged 40-<60 years old with mean age **44.037±10.87** years. As regard to gender, 55.0% of the studied patients were males. Moreover, 32.5 % of the studied patients were read and write. Regarding marital status, 87.5% of the studied patients were married and 65.0% of them were working.

Table (2): revealed that, 62.5 % of the studied patients suffered from abdominal pain chief as complain/associated signs and symptoms on admission, 44.8 % of them had diabetes mellitus. Moreover, 40.0 % of Performed the studied patients cholecystectomy operation, family members suffer from chronic disease, 56.8 % of them had hypertension.

Table (3) Revealed that, all (100.0%) of the studied patients had normal oxygen saturation, 95.0 % of them had normal arterial blood PH, while, 45.0 %, 42.5 % of them had hyperthermia and tachycardia respectively. Regarding serum electrolyte, 92.5 % of studied patients had normal level for serum Na, K and create. In addition to complete blood count, 87.5 % of the studied patients had normal level of hematocrit and 57.5% of them had low level of hemoglobin, while 35.0 % of them had high level of WBC count.

Figure (1): illustrate that 71.3% of the studied patients had length of stay

(1<7) days and 28.7% of them had length of stay (7 \leq 14)

Figure (2): showed that of studied patient's regarding their numerical pain rating scale of post abdominal surgery , 60.0 % of the studied patients had moderate level of pain, while 27.5 % of them had severe pain level.

Figure (3): showed that of studied patient's total postoperative wound care assessment, 51.2% of the studied patients had wound regeneration and only 3.8 %

of them had wound degeneration, while 45.0% of them had health tissue.

Table (5): revealed that there were a statistically significant relation between total postoperative wound care assessment of studied patients and their age, gender and educational level ($P=0.000^*, 0.005^* \& 0.015^*$) respectively.

Table (6): Indicates that, there were statistically significant relation between numerical pain rate of the studied patients post abdominal surgery and their age (P=0.009*).

Table (1): percentage distribution of demographic data among patients included in the study (n=80).

Demographic data	No.	%
Age		
20 <40 years	32	40.0
40 <60 years	36	45.0
≥60 years	12	15.0
Mean ±SD	44.03	7±10.87
Gender		
Male	44	55.0
Female	36	45.0
Level of education		
Can't read and write	24	30.0
Read and write	26	32.5
Secondary education	12	15.0
Higher education	18	22.5
Marital status		
Married	70	87.5
Not married	10	12.5
Occupation		
Work	52	65.0
No works	28	35.0

Present medical history	No.	%
Chief complain on admission *		
Abdominal pain	50	62.5
Palpitation	10	12.5
Nausea and vomiting	26	32.5
General Weakness	12	15.0
Constipation	28	35.0
Abdominal distension	34	42.5
Past medical history and surgical history		
Types of chronic diseases (n=58)*		
Diabetes mellitus	26	44.8
Hypertension	18	31.0
Cardiovascular disease	6	10.3
Kidney disease	8	13.8
liver disease	4	6.9
Current surgery		
Colostomy	16	20.0
Cholecystectomy	32	40.0
Urostomy	8	10.0
Hernia repair	24	30.0
Family history suffer from chronic disease		
Relation (n=74)		
First degree	24	32.4
Second degree	39	52.7
Third degree	11	14.9

Table (2): Percentage distribution of medical history among patients included in the study (n=80).

Table (3) percentage distribution of acute physiology and chronic health evaluation among patient included in the study (n=80).

Items	W no	ithin rmal	Below normal		Above normal	
	No.	%	No.	%	No.	%
1-Body temperature	44	55.0	0	0.0	36	45.0
2-Mean blood pressure	52	65.0	0	0.0	28	35.0
3-Pulse (per/min)	46	57.5	0	0.0	34	42.5
4-Respiratory rate (per/min)		65.0	0	0.0	28	35.0
5-Oxygen saturation		100.0	0	0.0	0	0.0
6-Arterial blood PH		95.0	4	5.0	0	0.0
7-Serum electrolyte						
a-Serum Na (mmol/l)	74	92.5	4	5.0	2	2.5
b-Serum k (mmol/l)	74	92.5	4	5.0	2	2.5
c-Serum create,(mg/Dl)		92.5	0	0.0	6	7.5
8-Complete blood count (CBC)					-	
a- Hemoglobin	34	42.5	46	57.5	0	0
b- WBC	52	65.0	0	0.0	28	35.0
c- Hematocrit (%)	70	87.5	0	0.0	10	12.5

Figure (1): Distribution of the studied patients regarding their length of stay/ days



Figure (2): Percentage distribution of the studied patients regarding their' numerical pain rate post abdominal surgery.



Figure (3): Percentage distribution of the studied patients' total postoperative wound care assessment.



Table (5) statistically relation	between	total	postoperative	wound	care	assessment	and
demographic data of the studie	l patients	(n=80)).				

	Tissue health		Wo	und	W	ound	Chi-square	
Items			regeneration		dege	neration		p -
	(n=36)		(n=41)		(n=3)			r value
	No.	%	No.	%	No.	%		value
Age	-	-					-	
20 <40 years	26	72.2	6	14.6	0	0.0		
40 <60 years	9	25.0	26	63.4	1	33.3	33.765	0.000*
≥60 years	1	2.8	9	22.0	2	66.7		
Gender	-							
Male	27	75.0	16	39.0	1	33.3	10.615	0.005*
Female	9	25.0	25	61.0	2	66.7	10.015	0.003
Level of education	-		-				-	
Can't read and write	10	27.8	14	34.1	0	0.0		
Read and write	16	44.4	7	17.1	3	100.0		
Secondary education	6	16.7	6	14.6	0	0.0		
Higher education	4	11.1	14	34.1	0	0.0	15.725	0.015*
Marital status								
Married	31	86.1	36	87.8	3	100.0	0.406	0.791
Not married	5	13.9	5	12.2	0	0.0	0.490	0.781
Occupation								
Work	25	69.4	24	58.5	3	100.0	2 6 9 1	0.262
No works	11	30.6	17	41.5	0	0.0	2.001	0.202

			N	Iild	Moderate		Sever		Chi-square	
Items			(n=10)		(n=48)		(n=22)		V 2	p-
			No.	%	No.	%	No.	%	Λ	value
	Age									
20 <40 year	s		9	90.0	18	37.5	5	22.7		
40 <60 year	s		1	10.0	22	45.8	13	59.1	13.404	0.009*
≥60 years			0	0.0	8	16.7	4	18.2		
	Gender		-	-	-		_		_	
Male			6	60.0	27	56.3	11	50.0	0.254	0.838
Female			4	40.0	21	43.8	11	50.0	0.354	
	Level of	f educatio	on							
Can't read an	nd write		3	30.0	15	31.3	6	27.3		
Reads and w	rites		1	10.0	17	35.4	8	36.4		
Secondary education			2	20.0	8	16.7	2	9.1		
Higher educa	ation		4	40.0	8	16.7	6	27.3	4.941	0.551
	Marita	status								
Married			10	100.0	40	83.3	20	90.9	2 424	0.208
Not married			0	0.0	8	16.7	2	9.1	2.424	0.298
	Occupation									
Work			9	90.0	29	60.4	14	63.6	3 208	0.201
No works			1	10.0	19	39.6	8	36.4	5.208	0.201

Table (6) statistically rela	ation between	n numerical	pain rate	post	abdominal	surgery	and
demographic data of the s	tudied patier	nts (n=80).					

Discussion

Regarding distribution of the studied patients according to their demographic data the current study showed that, less than half of the studied patients were aged 40-<60 years old with mean age 44.037±10.87 years. This may be explained by physiological changes and health problems after age of 40 years. These results were different with the study performed by Venianaki et al., (2021), entitled with "Postoperative nutrition practices in abdominal surgery patients in a tertiary referral hospital Intensive Care Unit" and revealed that the mean age of patients was 58.8 ± 2 .

As regard to gender, more than half of the studied patients were males. This may be due to the nature of men work and stress resulted from their working environment. These results were in accordance with the study performed by **Alharbi et al., (2023),** which titled "Factors Affecting the Length of Stay in the Intensive Care Unit among Adults in Saudi Arabia" and revealed that more than half of patients were males.

Moreover, nearly one third of the studied patients was read and write. This may be due to families' lack of awareness regarding the importance of education and giving the priority to work rather than learning. These results were incongruent with the study conducted by Rajabiyazdi et al., (2021), entitled with "Understanding the meaning of recovery patients undergoing abdominal to surgery" and found that the majority of patients hold high school and university degrees.

Regarding marital status, the vast majority of the studied patients were married. These results agreed with the study performed by **Abd Al Jaleel**, & **Bakey.** (2024), who studied "Effectiveness of Self-Care Program on Patients' Knowledge with Cholecystectomy" and revealed that the majority of patients were married.

Additionally, the current study revealed that nearly two thirds of patients were working. This may be because work is the source of family income to fulfill the family needs. These results were supported by the study conducted by **Mahdy & Mohamed**, (2020), entitled with "Effect Self-Care Learning Package on wound healing among Patients Undergoing abdominal surgery" and revealed that more than two thirds of patients were married and working.

According to distribution of the studied patients regarding their present history the current study revealed that, less than two thirds of the studied patients suffered from abdominal pain as chief complain on admission. This may be attributed to the sample selection criteria of abdominal surgical patients in which the problems is in abdomen. These results were incongruent with Liu et al., (2023), who studied "Postoperative pain-related outcomes and perioperative pain management in China" and revealed that less than one fifth of patients had pain prior surgery.

As regard to distribution of the studied patients regarding their past medical history the current study indicated that, nearly three quarters of the studied patients suffered from chronic disease and less than half of them had diabetes mellitus. This may be attributed to the effect of poorly managed chronic diseases such as diabetes mellitus on health status deterioration. These results were in difference with the study performed by **Alharbi et al.**, (2023), who revealed that nearly three quarters of patients hadn't diabetes mellitus or other chronic health diseases. These results were similar with **liu et al.**, (2023), who revealed that less than half of patients had diabetes mellitus.

Concerning distribution of the studied patients regarding their surgical history the current study showed that, two fifth of the studied patients cholecystectomy operation performed and more than three quarters of them performed their surgery under spinal anesthesia. This may be because spinal Anaesthesia in more safe and feasible and are preferred by physicians when performing cholecystectomy. These results were supported by Rajabiyazdi et al., (2021), who conducted study titled "Understanding the meaning of recovery undergoing patients abdominal to surgery" and revealed that more than half of patients had previous abdominal surgery. These results agreed with the study carried out by Joseph & Devi, (2023),

distribution Regarding of the studied patients regarding their family history the current study indicated that, most of the studied patients had family members suffer from chronic disease and were from the second degree. This may be because chronic diseases are genetically transferred from generation to another.

These results were supported by the study performed by **Serag et al., (2022),** entitled with "Effect of an educational program regarding care of wound healing for venous leg ulcer patients" and revealed that the majority of patients had family history of chronic disease. These results were in the same line with the study conducted by **Bekele et al.**, (2024), entitled with "Outcomes and factors associated with prolonged stays among patients admitted to adult intensive care unit in a resource-limited setting" and revealed that nearly two fifth of patients had family history of hypertension.

Concerning distribution of the studied patients regarding their acute chronic physiology and health evaluation the current study revealed that, all of the studied patients had normal oxygen saturation, most of them had normal arterial blood PH, while, less than half of them had hyperthermia and tachycardia. Close patient monitoring in ICU especially in maintaining normal oxygenation .while, hyperthermia and tachycardia are indicators of wound infection .These results were compatible with Miri et al., (2021), who studied "Effect of Local Cold Therapy on Arterial Blood Oxygen Saturation and Temperature Changes Patients in Undergoing Surgery" and found that the mean oxygen saturation was 91.2±4.7 and the mean score of temperature was 37.95 ± 0.36 which indicating hyperthermia.

Regarding serum electrolyte, most of studied patients had normal level for serum sodium, potassium and create. In addition to complete blood count, the vast majority of the studied patients had normal level of hematocrit, while more than one third of them had high level of WBC count this is indicate to wound infection.

These results were in the same line with the study conducted by **Bekele et al.**, (2024), who studied "Outcomes and factors associated with prolonged stays patients admitted to adult among intensive care unit in a resource-limited setting" and revealed that more than one third of patients had high level of WBC count and These results were congruent with the study conducted by Amiri et al., (2020), entitled with "Factors associated with length of hospital stay following liver transplant surgery" and revealed that the mean score for creatinine level for patients was 0.98 ± 0.62 which indicating normal level. This may be attributed to effective nursing care provided and close postoperative patients monitoring.

As regard to percentage distribution of the studied patients regarding their' numerical pain rate post abdominal surgery the current study illustrated that, more than half of the studied patients had moderate level of pain, while more than one quarter of them had severe pain level. This may be attributed to patients administered pain control analgesia postoperatively. These results were similar with the study performed by Baamer et al., (2022), which titled "Experience of pain in patients undergoing abdominal surgery and nursing approaches to pain control" and revealed that about one quarter of patients had severe pain. While, more than one third of them had moderate pain. These results were congruent with Liu et al., (2023), who performed study entitled "Postoperative pain-related outcomes and perioperative pain management in China" and revealed that nearly half of patients had moderateto severe acute postoperative pain and less than one third of them had severe pain

Concerning statistically relation between total postoperative wound care assessment and demographic data

among the studied patients the current study showed that, there were a statistically relation significant between total postoperative wound care assessment of studied patients and their age, gender and educational level (P= 0.000*, 0.005* & 0.015^*). This may be because aging has a significant impact on the skin's healing function by prolonging the inflammatory phase and increasing the production of reactive oxygen species. This shifts the healing process towards having more protein degradation, which can lead to chronic wound healing with an abundance of complications.

These results were supported by Xiao et al., (2024), who studied "Study on the risk factors of postoperative wound complications in patients with ankle fracture" and found that age ≥ 60 years old was an independent risk factor for postoperative wound complications. These results agreed with Serag et al., (2022), who revealed that there was a statistically significant relation between total postoperative wound care assessment of studied patients and their educational level (p=0.011).

Regarding correlation between total postoperative wound care assessment and acute physiology and chronic health evaluation among studied patients post abdominal surgery the current study showed that there was a positive statistically significant correlation between total postoperative wound care assessment and acute physiology and chronic health evaluation among studied patients post abdominal surgery. This may be attributed to the effect of normal physiological parameters and good oxygenation on normal wound regeneration process.

These results were supported by Yelamanchi et al., (2020), who studied "Comparative study between P- POSSUM and Apache II scores in predicting outcomes of perforation peritonitis" and revealed that APACHE II scores had a good association with post-operative wound dehiscence. On the other hand, these results were incompatible with Do et al., (2021), who studied "Apache II scoring in predicting surgical outcome in patients of perforation peritonitis" and noted that the patient having APACHE II score more than 10 had significant higher post-operative wound infection incidence as compared to patients having APACHE II score less than 10.

Conclusion

Based upon the results of current study it concluded that

There were many factors that affecting length of stay among the patients post abdominal surgery in ICU including: demographic data (age, gender and level of education), medical data, physiological (vital signs, WBC).

Recommendations

- Based on the find Designing health education program for patients undergoing abdominal surgery to improve their knowledge in order to enhance their quality of life.
- Developing intervention protocol regarding observation and monitoring patient's postoperative abdominal surgery to improve their health outcomes and to detect the associated complications.
- Designing rehabilitation program with multi-disciplinary team is necessary for all patients post abdominal surgery to decrease their length of stay in the intensive care unit and enhancing their recovery.

- Replication of the study on large probability sample selected from different geographical areas in egypt to obtain more generalized data.

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