

Assessment the Post Operative Complication among Patients with General Anesthesia

Mariam Mohammed Ali Kareem¹, Ali Fadel Abbas², Nada Jassem Yassien³, Thuraya Ali Baseer⁴, Layla Raheem Hakem⁵
^{1,2,3,4,5}University of Kufa, Iraq



DOI : <https://doi.org/10.61796/jmgcb.v2i5.1300>



Sections Info

Article history:

Submitted: March 30, 2025
Final Revised: April 14, 2025
Accepted: April 28, 2025
Published: May 12, 2025

Keywords:

General anesthesia
Postoperative complications
Descriptive quantitative study

ABSTRACT

Objective: Each year, increasing numbers of people are undergoing surgery. Many of these patients are older and have multiple comorbidities. General anesthesia is very common anesthetic procedure which is used in several surgical approaches. Without general anesthesia many of these surgeries are lifesaving or life-changing and would not be possible. But all medical procedures are associated with some complications, even when they are performed by experts. The severity and rate of these complications depend on patient's state of health. **Method:** A Descriptive quantitative design study has been used in the present study to estimate the Post operative complication among patient undergo the general anesthesia at Al-Sadder Medical City and Al-Hakeem hospital during the October,15th, 2023 to March,28th ,2024. **Results:** According to the current study sample researcher found the most common complication in the respiratory system was difficult breathing (50%). Regarding Gastrointestinal complications recent study showed that the highest percentage were nausea (71.0%), constipation (68.33%) and vomiting (58%). The highest percentages of complication in the cardiovascular system was hypotension (41.7%). There is low percent in urinary incontinence and dysuria with (20%) and (16.67%). Regarding to the general complications the result show that headache is the most common with (82%) from all sample. **Novelty:** Most of present study sample were diabetic patient (66.7%), those with previous surgery (66.7%), those with only one previous surgery (25%), the most complication after general anesthesia were Headache, Nausea, Chills, Constipation Motor deficit. And there is no correlation between patient who had previous surgery and who had not.

INTRODUCTION

Each year, increasing numbers of people are undergoing surgery. Many of these patients are older and have multiple comorbidities. General anesthesia is a reversible state of unconsciousness that allows patients to undergo surgical procedures in a safe and humane way. Although it is increasingly safe, general anesthesia is not without risks and complications. Anesthesia-related mortality is rare and has declined significantly over the past 5 decades [1].

General anesthesia is overall safe and those with significant health conditions also can undergo procedures under general, but it can have countless minor and major complications. The incidence of postoperative complications depends on several factors, some of which are related to surgical procedures. The risk factors or complications depend on the type of procedures, general physical health rather than the type of anesthesia. People having serious medical conditions such as smoking, high blood pressure, obesity, diabetes, stroke, seizures, obstructive sleep apnea, any condition

involving kidney, lung and heart disease, drug allergies, anticoagulants, and history of allergy to GA, poor nutrition can be aggravating factors for anesthesia [2].

General anesthesia is very common anesthetic procedure which is used in several surgical approaches. Without general anesthesia many of these surgeries are lifesaving or life-changing and would not be possible. But all medical procedures are associated with some complications, even when they are performed by experts. The severity and rate of these complications depend on patient's state of health [3].

Anesthesia is a state of narcosis (severe central nervous system depression produced by pharmacologic agents), analgesia, relaxation, and reflex loss. Patients under general anesthesia are not arousable, not even to painful stimuli. They lose the ability to maintain ventilatory function and require assistance in maintaining a patent airway. Cardiovascular function may be impaired as well [4].

There are two types of anesthesia: general and local (regional). General anesthesia causes the patient to lose sensation, consciousness, and reflexes. It acts directly on the central nervous system. Local anesthesia blocks nerve impulses along the nerve where it is injected, resulting in the loss of sensation to a region of the body without the loss of consciousness is accomplished by giving the patient anesthetic agents either by intravenously or as an inhalable agent [5].

In some hospitals and ambulatory surgical centers, post anesthesia care is divided into three phases. In the phase I PACU, used during the immediate recovery phase, intensive nursing care is provided. In the phase II PACU, the patient is prepared for self-care or care in the hospital or an extended care setting. In phase III PACU, the patient is prepared for discharge. Patients may remain in a PACU unit for as long as 4 to 6 hours, depending on the type of surgery and any preexisting conditions [6].

Complications from general anesthetic are rare, the risk of serious complications from anesthesia is generally less than 1%. Mortality attributable to general anesthesia is said to occur at rates of less than 1:100,000 from an unforeseen complication, such as an allergic reaction or a heart attack. Post-operative Nausea and Vomiting (PONV) is a common side effect of anesthesia, occurring in up to 30% of post-operative patients. The incidence of anaphylaxis is estimated between 1 in 10,000 and 1 in 20,000 anesthetic procedures [7].

The most common minor post-operative side effects include nausea, vomiting, or sore throat, from the usage of endotracheal intubation, shivering and sleepiness. Nausea is a state of discomfort often followed by the expulsion of stomach contents it was noted that postoperative nausea and vomiting (PONV) was more frequent after operation that used general anesthesia compared to operations that used regional anesthesia. The occurrence in the recovery room ranges from an over 0% to 30% [8].

Breathing is major part of a surgical procedure done in general anesthesia. The patient is dependent on the caregivers solely as his or her respiratory system is manually kept going through use of respiratory machines. The muscle relaxants used in the induction make it so that the patients tongue blocks the airways, thus an intubation tube is inserted in order to keep the airways open. Patient Breathing should be monitored

closely after the procedure as well to ensure right oxygenation levels and effortless respiration [9].

Hypoventilation, inadequate ventilation, can happen during and after the surgery and affects post-operative care. If a patient experiencing hypoventilation he can develop hypoxemia, oxygen deficiency in arterial blood, or hypoxia, impaired tissue oxygenation. Those are challenging pulmonary complications of general anesthesia [10].

Pulmonary atelectasis, the collapse or impaired functioning of a lung or a part of a lung is usually common among anesthetized patients. First symptoms could be coughing, chest pain and difficulty in breathing with breathlessness. Atelectasis induces reduction of functional residual capacity, which decreases inhaled oxygen volumes. It could be triggered by the changes in the absorption of gases and pressures occurring during general anesthesia or by a bronchial obstruction [2].

General anesthesia may cause cardiovascular changes ranging from hypovolemia, hypotension, hypertension, heart failure, and cardiac arrest in patients having underlying reasons. Postoperative hypotension can occur due to a variety of factors such as reduced cardiac output, hypovolemia, and vasodilatation reduced myocardial contractility, and cardiac arrhythmias [11].

Cardiac arrhythmias can occur during or after general anesthesia. Most of the arrhythmias are benign, which require no treatment and revert back to sinus rhythm before the patient is discharged. Preventive measures, such as monitoring, risk factor charting and choosing of correct anesthetic agents, should be done prior the surgery. Risk factors for arrhythmias are age, ASA rating of 3 or 4, previous cardiovascular diseases and electrolyte imbalance. Some anesthetic agents can cause dysrhythmias; anesthetic drugs can exacerbate the arrhythmias if the patient has a history of cardiovascular disease [12].

Hypovolemia is considered the most common cause of hypotension after general anesthesia. Reason for hypovolemia most often is post-operative bleeding or fluid loss. Intra-operative bleeding usually is more obvious and can be treated accordingly during the operation, but post-operative bleeding has a higher chance of being unnoticed. States that fluid loss can happen because of evaporation, which is a result of a prolonged surgery on body cavities, or because of tissue damage leading to edema [12].

Hypothermia During anesthesia, the patient's temperature may fall. Glucose metabolism is reduced, and, as a result, metabolic acidosis may develop. This condition is called hypothermia and is indicated by a core body temperature that is lower than normal (36.6C [98.0F] or less). Inadvertent hypothermia may occur as a result of a low temperature in the OR, infusion of cold fluids, inhalation of cold gases, open body wounds or cavities, decreased muscle activity, advanced age, or the pharmaceutical agents used (eg, vasodilators). Patients who have received anesthesia are susceptible to chills and drafts after surgery [13].

Hypothermia management, begun in the intraoperative period, extends into the postoperative period. Low body temperature is reported to the physician. The room is

maintained at a comfortable temperature, and blankets are provided to prevent chilling [6].

Post-operative care of the patient has to take in account the neurological issues one can have after being under general anesthesia. Post-operative cognitive dysfunction is a fairly common occurrence; approximately 9.9% of patients have a cognitive level change after the surgery. Inducement of emergence delirium, a state of psychomotor agitation with disorganized thinking and emotional distress after emerging from general anesthesia, causes the patient discomfort and may even be harmful to the care if their behavior turns agitated or violent [12].

The post-anesthesia care unit (PACU) nurses provide care to patients in the postoperative period when they are at greatest risk for respiratory and cardiovascular complications during recovery from surgery and anesthesia. The first evaluation begins by evaluating the patient's neurological, airway, respiratory and circulatory status. The initial neurological assessment should focus on the level of consciousness, such as orientation, sensory and motor status, pupillary size, equivalence, and responsiveness [14].

The patient may be awake, drowsy, or asleep. Since hearing is the first returning sense in the unconscious patient, all activities should be explained to the patient from the moment of admission to PACU. Patient characteristics such as residual neuromuscular blockade, opioid use, and sleep breathing impairment (e.g. obstructive sleep apnea) affect oxygenation and ventilation. The nurse must be alert for signs of inadequate oxygenation and ventilation. Any signs of respiratory distress require immediate intervention [15].

Blood pressure should be measured and compared with the previous value. Body temperature, peripheral pulses, capillary vessel filling and skin condition (e.g., color, humidity) are evaluated. Any signs of inadequate tissue perfusion require immediate intervention. The urinary system should be evaluated by measuring fluid intake and output and determining fluid balance. Attention should be paid to the presence of all IV lines; all irrigation solutions and infusions; and all outlet devices, including catheters and wound drains. The operation site should be evaluated, and the condition of the dressing, and the type and amount of drainage should be noted. Instructions on incision care should be followed [16].

Care process after-anesthesia covers all levels of care in most institutions, but some institutions offer Phase-I and Phase-II services. In Phase-I, treatment and care are continued until the patient is transferred to another unit in the postoperative period. At this stage, the nurse monitors the airway, oxygen therapy, vital signs, complications, and symptoms. Phase II requires less follow-up, treatment, and observation than Phase I. This stage is generally intended for patients undergoing day surgery [17].

Nursing care in post anesthesia care unit aims to take into account the patient's condition after surgical intervention. This allows healthcare professionals, especially nurses, to identify and repair the needs of patients whose condition is worsening. However, many barriers to nursing care in the PACU have been identified. This review elucidates the significance and methodology of nursing care [14].

Importance of Study

Complications and critical incidents arising during anaesthesia due to patient, surgical or anaesthetic factors, may cause harm themselves or progress to more severe events, while complications following anaesthesia and surgery are well described, events that occur during anaesthesia are less well documented. Many may be managed effectively without serious or long-term consequences, but some, including serious airway, cardiovascular and drug-related complications, have the potential to cause harm or progress to more serious events, including cardiac arrest or death [18].

Major complications of airway management. accidental awareness during general anaesthesia. and life-threatening anaphylaxis. For many of these complications, progression may result in a final common pathway of peri-operative cardiac arrest, perhaps the most feared of all complications of anaesthesia and surgery [19].

Delayed recovery (DR) from anesthesia generally refers to that the patient has not recovered 120 minutes after the end of general anesthesia and cannot respond correctly to external stimuli and language commands. With the continuous development of anesthetics and related monitoring technologies, the incidence of delayed recovery has been declining year by year, but it is still one of the main complications of general anesthesia [20].

There is widespread recognition that human factors are key to the safe delivery of healthcare in the UK. Human factors are defined as: “enhancing clinical performance through an understanding of the effects of teamwork, tasks, equipment, workspace, culture and organization on human behaviour and abilities and application of that knowledge in clinical settings” or more simply, “the science of improving human performance and well-being, by examining all the effectors of human performance [21].

Many studies have shown the association between American Society of Anesthesiologists (ASA) physical status and postoperative morbidity and mortality, but the link with intra-operative complications has been comparatively understudied. In this study, increasing American Society of Anesthesiologists physical status grade was associated strongly with the risk of any complication; patients who had American Society of Anesthesiologists physical status 3 and 4 were twice and five times as likely to have an intra-operative complication, respectively. Within the 24-hour peri-operative window, assessed reported rates of “any fatal or life-threatening accident, or any accident producing severe sequela [22].

Drugs used for the induction, maintenance and reversal of anesthesia carry the risk of adverse reactions. Adverse drug reactions (ADRs) include overdose, adverse and secondary effects, idiosyncratic reactions, drug intolerance and allergic reactions. Reports of severe ADRs in anesthesia appear to be increasing. This has been attributed to the use of a greater number of drugs during the perioperative period as well as to cross-reactivity between drugs. ADRs usually occur during the induction of anesthesia but may occur at any time in the perioperative period. In 60 to 80% of cases, the observed manifestation of ADRs during general anesthesia is cardiovascular collapse. In one report, overdose was found to contribute to anesthetic mortality in 43 of 161 patients [23]. Each year in the

United States, anesthesia/anesthetics are reported as the underlying cause in approximately 34 deaths and contributing factors in another 281 deaths, with excess mortality risk in the elderly and men [24].

Mortality risk associated with anesthesia has been the subject of extensive research for many decades.¹⁻⁵ In a landmark study involving ten academic medical centers and 599,500 surgical patients in the United States during 1948–1952, Beecher and Todd⁶ found that the anesthesia-related death rate was 64 deaths per 100,000 procedures, varying markedly by anesthetic agents, types of providers, and patient characteristics [24]. To assess postoperative complication among patients with general anesthesia. comparison between patient who have had a previous surgery and who have no previous surgery. To find out relationship between postoperative complication among patients with general anesthesia and demographic data.

RESEARCH METHOD

Design of study

Non-probability random study sample design has been used in the present study to estimate the Post operative complication among patient undergo the general anesthesia at Al-Sadder Medical City and Al-Hakeem hospital during the October,15th, 2023 to March,28th,2024.

Administrative Agreements and Ethical Considerations

The researcher gets consent from the Adult Nursing Branch in the Faculty of Nursing / University of Kufa. Furthermore an consent is attained from Al-Najaf Al-Ashraf Health Directorate recovery room in Al-Sadder Medical City in order to interview each subject. The consent had made it easy to arrive the institutions and meet the patients for the necessary data after taking their permission to participate in the study.

Setting of the Study

The study is implemented in Al-hakeem hospital, and Al-Sadder Medical City/ the hospital includes:

1. Surgical wards (floor 1,2, 3, 5&6).
2. Surgical Emergency department: surgical ward.

Study Sample

Non-probability (purposive) sample of 60 patient those who had surgery with general anesthesia. Including Criteria:

1. Patient aged 16 years or more.
2. Patient who has surgery at 10 day or below.

Criteria for Excluding from the Sample

1. Patient who undergoes general anesthesia, but they refuse to complete in participate in the study.
2. Patient who had surgery more than 10 day.
3. Patient age under 16 years.

Study Instrument

An assessment tool used to Assessment the post operative complication among patient after general anesthesia. The final study instrument consisted of three parts as the following:

Part I: Scio-Demographic characteristics

This part includes (Age, Gender, Residency, Material status, educational status, Occupation), (Appendix-C).

Part II: Medical information concerning patients' complication

The second part of checklist contains three items these items include (medical history, surgical history, smoking and type of current surgery).

Part III: Complications of General Anesthesia

Is constructed to assess post operative complication among patient with general anesthesia. The questionnaire sheet is also complete by the researcher according to the answers the patient. Answering is composed of (yes, no) question. The question about complication of general anesthesia includes (Respiratory complications, Gastrointestinal complications, Cardiovascular complications, Neurological complications, Urinary system complications and General complications).

Data Collection

The data was collected from patients after obtaining approval from the Najaf Health Directorate in the period between January, 25th, 2024 to February, 16th, 2024, on structured Performa designed specifically for this study and by means of structured interview technique with the individuals by the using of Arabic version of the questionnaire.

Validity of the Questionnaire and the Program

The validity of checklist the researchers presented the questioner to 10 experts in the adult nursing branch in the faculty of nursing/ university of Kufa.

Statistical Analysis

Data of studied sample were entered and analyzed using the statistical package for social sciences (SPSS) version 25. Analysis included the two types of statistics:

Descriptive statistics

Presented as mean, standard deviation, frequencies and percentages. All continuous variables were tested for statistical normal distribution using bar charts and normal distribution curve.

Inferential Statistics

Statistical tests were applied according to the distribution and type of variables. Chi-square test used to compare frequencies of categorized variables. Level of significance of ≤ 0.05 was considered as significant difference or correlation.

RESULTS AND DISCUSSION

Results

Table 1. Descriptive statistics (frequency and percentage) for the demographic data of patients.

Demographic data	Sub-groups	Frequency (N=60)	Percentage
Age / years	16-26	25	41.7
	27-37	12	20.0
	38-48	11	18.3
	49-59	8	13.3
	60-70	4	6.7
Gender	Male	12	20.0
	Female	48	80.0
Residence	Rural	12	20.0
	Urban	48	80.0
Marital Status	Single	19	31.7
	Married	39	65.0
	Divorced	2	3.3
Level of Education	Unable To Read / Write	5	8.3
	Primary School Graduated	16	26.7
	Intermediate School Graduated	8	13.3
	Secondary School Graduated	8	13.3
	Institutes / Collage	23	38.3
Occupation	Free Job	4	6.7
	Employee	1	1.7
	Housewife	26	43.3
	Jobless	3	5.0
	Retired	9	15.0
	Students	17	28.3

The demographic data are presented in table 1, this table shows that the majority of the patients' subgroups are: those with ages ranging between (16-26) years (41.7%); female (80%), those live in urban areas (80%), those who are married (65%), those who are institute or college graduated (38.3%), those who are housewives (43.3%).

Table 2. Descriptive statistics (frequency and percentage) for the medical or clinical history of patients.

Post medical & surgical history	Sub-groups	Frequency (N=60)	Percentage
Chronic Diseases	Hypertension	2	3.3
	Diabetes	40	66.7
	Hypertension + Diabetes	4	6.7

	Chronic Respiratory Disease	5	8.3
	Hypertension + Others	1	1.7
	Others	3	5.0
	No Chronic Diseases	5	8.3
Is the patient have previous surgery?	Yes	40	66.7
	No	20	33.3
	No	20	33.3
Number of previous surgeries?	One	15	25.0
	Two	13	21.7
	Three	9	15.0
	Four	2	3.3
	Eight	1	1.7
Smoking	Yes	7	11.7
	No	53	88.3
	less than 5 years	4	6.7
Duration	Between 5-10 years	1	1.7
	Between 15-20 years	1	1.7
	Over 20 years	1	1.7
	No smoking	53	88.3
Current Surgery	Medical operation	21	35.0
	Fracture	5	8.3
	Neurological	8	13.3
	Others	26	43.3
	1-3 day	43	71.7
Date of previous Surgery	3-6 day	10	16.7
	6-10 day	7	11.7

The medical or clinical history is presented in table 2, this table shows that most of the patients are: those with diabetes (66.7%), those with previous surgery (66.7%), those with only one previous surgery (25%), those with no smoking (88.3%), those with medical operations (35%), those with (1-3) days duration of previous surgery (71.7%).

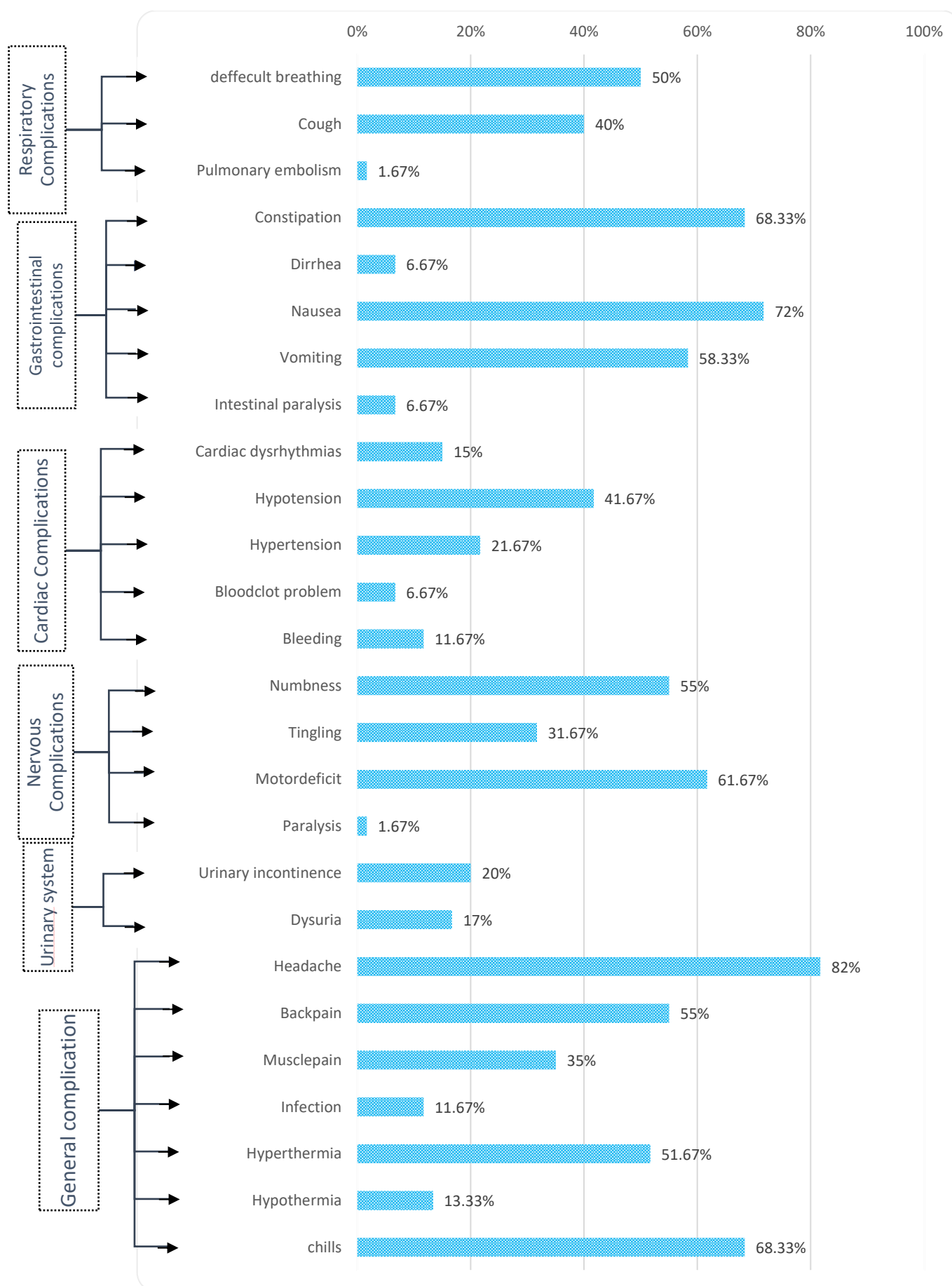


Figure 1. Descriptive statistics of general complications: among patients¹.

Figure 1 shows the descriptive statistics of complications among patients. According to this chart, the most frequently common complications are: Difficult of breathing (50%), Cough (40%), Constipation (68.33%), Nausea (71.67%), Hypotension (41.67%), Numbness (55%), Tingling (31.67%), Motor deficit (61.67%), Headache (81.67%), Back pain (55%), Muscle pain (35%), Hyperthermia (51.67%), Feeling cold/ Chills (68.33%).

Table 3. Descriptive statistics of respiratory complications among patients' and differences between those with previous surgery and those without.

Respiratory system complications		With Previous Surgery (n=40)		Without Previous Surgery (n=20)		Chi Square (P value)
		Freq.	Percent	Freq.	Percent	
Difficult of breathing	No	22	55	8	40	1.2 (0.41)
	Yes	18	45	12	60	
Cough	No	25	62.5	11	55	0.31 (0.59)
	Yes	15	37.5	9	45	
Pulmonary embolism	No	40	100	19	95	2.03 (0.33)
	Yes	0	0	1	5	

Table 3 shows the Descriptive statistics of respiratory complications among patients' and differences between those with previous surgery and those without. According to this table, there is no significant difference between patients with previous surgery and those without previous surgery.

Table 4. Descriptive statistics of gastrointestinal complications among patients' and differences between those with previous surgery and those without.

Gastrointestinal complications		With Previous Surgery (n=40)		Without Previous Surgery (n=20)		Chi Square (P value)
		Freq.	Percent	Freq.	Percent	
Constipation	No	15	37.5	4	20	1.88 (0.24)
	Yes	25	62.5	16	80	
Diarrhea	No	37	92.5	19	95	0.134 (1.00)
	Yes	3	7.5	1	5	
Nausea	No	11	27.5	6	30	0.05 (1.00)
	Yes	29	72.5	14	70	
Vomiting	No	16	40	9	45	0.137 (0.78)
	Yes	24	60	11	55	
Intestinal paralysis	No	37	92.5	19	95	0.134 (1.00)
	Yes	3	7.5	1	5	

Table 4. shows the descriptive statistics of gastrointestinal complications among patients' and differences between those with previous surgery and those without. According to this table, there is no significant difference between patients with previous surgery and those without previous surgery.

Table 5. Descriptive statistics of cardiac complications among patients' and differences between those with previous surgery and those without.

Cardiac complications		With Previous Surgery (n=40)		Without Previous Surgery (n=20)		Chi Square (P value)
		Freq.	Percent	Freq.	Percent	
Cardiac dysrhythmias	No	36	90	15	75	2.35
	Yes	4	10	5	25	(0.14)
Hypotension	No	22	55	13	65	0.54
	Yes	18	45	7	35	(0.58)
Hypertension	No	31	77.5	16	80	0.05
	Yes	9	22.5	4	20	(1.00)
Blood clot problem	No	38	95	18	90	0.53
	Yes	2	5	2	10	(0.59)
Bleeding	No	34	85	19	95	1.29
	Yes	6	15	1	5	(0.40)

Table 5 shows the descriptive statistics of cardiac complications among patients' and differences between those with previous surgery and those without. According to this table, there is no significant difference between patients with previous surgery and those without previous surgery.

Table 6. Descriptive statistics of neurological complications among patients' and differences between those with previous surgery and those without.

Neurological complications		With Previous Surgery (n=40)		Without Previous Surgery (n=20)		Chi Square (P value)
		Freq.	Percent	Freq.	Percent	
Numbness	No	19	47.5	8	40	0.30
	Yes	21	52.5	12	60	(0.78)
Tingling	No	28	70	13	65	0.15
	Yes	12	30	7	35	(0.77)
Motor deficit	No	14	35	9	45	0.56
	Yes	26	65	11	55	(0.57)
Paralysis	No	40	100	19	95	0.25
	Yes	0	0	1	5	(1.00)

Table 6 shows the descriptive statistics of neurological complications among patients' and differences between those with previous surgery and those without. According to this table, there is no significant difference between patients with previous surgery and those without previous surgery.

Table 7. Descriptive statistics of urinary system complications among patients' and differences between those with previous surgery and those without.

Urinary system complications		With Previous Surgery (n=40)		Without Previous Surgery (n=20)		Chi Square (P value)
		Freq.	Percent	Freq.	Percent	
Urinary Incontinence	No	33	82.5	15	75	0.46 (0.51)
	Yes	7	17.5	5	25	
Dysuria	No	34	85	16	80	0.24 (0.71)
	Yes	6	15	4	20	

Table 7 shows the descriptive statistics of urinary complications among patients' and differences between those with previous surgery and those without. According to this table, there is no significant difference between patients with previous surgery and those without previous surgery.

Table 8. Descriptive statistics of general complications among patients' and differences between those with previous surgery and those without.

General complications		With Previous Surgery (n=40)		Without Previous Surgery (n=20)		Chi Square (P value)
		Freq.	Percent	Freq.	Percent	
Headache	No	7	17.5	4	20	0.05 (1.00)
	Yes	33	82.5	16	80	
Pain	No	19	47.5	8	40	0.30 (0.78)
	Yes	21	52.5	12	60	
Muscle pain	No	25	62.5	14	70	0.33 (0.77)
	Yes	15	37.5	6	30	

Infection	No	34	85	19	95	1.29
	Yes	6	15	1	5	(0.40)
Hyperthermia	No	19	47.5	10	50	0.03
	Yes	21	52.5	10	50	(1.00)
Hypothermia	No	33	82.5	19	95	1.80
	Yes	7	17.5	1	5	(0.25)
Feeling cold/ chills	No	15	37.5	4	20	1.88
	Yes	25	62.5	16	80	(0.24)

Table 8 shows the descriptive statistics of general complications among patients' and differences between those with previous surgery and those without. According to this table, there is no significant difference between patients with previous surgery and those without previous surgery.

Table 9. Association between the overall assessment of patients' respiratory complications and their demographic data.

Demographic data	Chi Square	df	P value	Sig.
Age / years	22.51	8	0.04	S
Gender	13.08	2	0.008	HS
Residence	7.08	2	0.11	NS
Marital Status	15.44	4	0.006	HS
Level of Education	3.81	8	0.26	NS
Occupation	2.07	10	0.75	NS

df= degree of freedom; NS: Non-significant at P value >0.05 ; S : Significant at P value <0.05 ;HS: high significant

Concerning table 9, it shows association between the overall assessment of patients' respiratory complications and their demographic data, it shows that there is a high-significant association ($P < 0.05$) between the patients' respiratory complications and their demographic data (gender and material status); and significant in age.

Table 10. Association between the overall assessment of patients' gastrointestinal complications and their demographic data.

Demographic data	Chi Square	df	P value	Sig.
Age / years	12.51	16	0.74	NS
Gender	7.08	4	0.28	NS
Residence	10.08	4	0.04	S
Marital Status	13.44	8	0.16	NS
Level of Education	3.81	16	0.66	NS
Occupation	2.07	20	0.85	NS

df= degree of freedom; NS : Non-significant at P value >0.05 ; S : Significant at P value <0.05

Concerning table 10, it shows association between the overall assessment of patients' gastrointestinal complications and their demographic data, it shows that there is a non-significant association ($P>0.05$) between the patients' gastrointestinal complications and their demographic data, except residence.

Table 11. Association between the overall assessment of patients' cardiac complications and their demographic data.

Demographic data	Chi Square	df	P value	Sig.
Age / years	16.51	16	0.84	NS
Gender	9.5	4	0.04	S
Residence	10.08	3	0.04	S
Marital Status	10.44	6	0.36	NS
Level of Education	13.81	12	0.46	NS
Occupation	12.07	15	0.65	NS

df= degree of freedom; NS : Non-significant at P value >0.05 ; S : Significant at P value <0.05

Concerning table 11, it shows association between the overall assessment of patients' cardiac complications and their demographic data, it shows that there is a non-significant association ($P>0.05$) between the patients' cardiac complications and their demographic data; except gender and residence.

Table 12. Association between the overall assessment of patients' nervous complications and their demographic data.

Demographic data	Chi Square	df	P value	Sig.
Age / years	13.51	12	0.24	NS
Gender	7.9	3	0.05	NS
Residence	6.08	3	0.07	NS
Marital Status	9.44	6	0.56	NS
Level of Education	14.81	12	0.16	NS
Occupation	13.07	15	0.45	NS

df= degree of freedom; NS : Non-significant at P value >0.05 ; S : Significant at P value <0.05

Concerning table 12, it shows association between the overall assessment of patients' nervous complications and their demographic data, it shows that there is a non-significant association ($P>0.05$) between the patients' nervous complications and their demographic data.

Table 13. Association between the overall assessment of patients' urinary complications and their demographic data.

Demographic data	Chi Square	df	P value	Sig.
Age / years	7.52	4	0.14	NS
Gender	2.9	1	0.05	NS
Residence	3.9	1	0.05	NS
Marital Status	0.94	2	0.89	NS
Level of Education	6.04	4	0.16	NS
Occupation	8.04	5	0.25	NS

df= degree of freedom; NS : Non-significant at P value >0.05 ; S : Significant at P value <0.05

Concerning table 13, it shows association between the overall assessment of patients' urinary complications and their demographic data, it shows that there is a non-significant association ($P>0.05$) between the patients' urinary complications and their demographic data.

Table 14. Association between the overall assessment of patients' general complications and their demographic data.

Demographic data	Chi Square	df	P value	Sig.
Age / years	11.52	24	0.84	NS
Gender	4.9	6	0.35	NS
Residence	1.9	6	0.45	NS
Marital Status	4.94	12	0.69	NS
Level of Education	5.04	24	0.96	NS
Occupation	18.04	30	0.75	NS

df= degree of freedom; NS : Non-significant at P value >0.05 ; S : Significant at P value <0.05

Concerning table 14, it shows association between the overall assessment of patients' general complications and their demographic data, it shows that there is a non-significant association ($P>0.05$) between the patients' general complications and their demographic data.

Discussion

Part-I: Discussion of Demographic Data of the patient in the Study Sample

According to table 1, this table shows that the majority of the patient subgroups are: those with ages ranging between (16-26) years (41.7%) this percentage touch to the percentage of study done by [25] who involve highest age group in (15-25) with percentage (46.11%).

According to the gender of the study subjects, the highest percentage is the female (80.0 %) and male (20.0%). So, the female participant was dominating. Also, the result of gender of the study done by [3] they found 54% were male whereas 46% were female, another study done by [26] were in all study sample was (43.1%) male.

Regarding the marital status, the high percentage is (65%) of the sample in sample are married the result of age group in the match with the results of another study they found the same result of marital status done by [27] and the level of education most of the patient were institute or graduated (38.3%) this finding due to the majority of patient contributing in the study sample were at age (16-26). The researcher found those who are housewives (43.3%).

The patient lives in urban areas (80%) because the hospital located in the city center. The analysis of chronic disease indicates that patient with diabetes is (66.7%), finding this study corresponds for the research of [28].

Percentage of patient who have previous surgeries is (66.6%) most of them have only one surgery (25.0%) this result is the same as research done by [26] majority of the participants (62%) had prior exposure to surgery and 38% had no previous surge and found ninety percent did not know the complications, types of anesthesia and 44% did not know that anesthesiologist is a doctor. The data suggest that the most of patient are not smoking (88.3%) because the most study sample was female (80.0 %).

Part II: Discussion the results of postoperative complications among patient undergo general anesthesia

According to the current study sample researcher found the most common complication in the respiratory system was difficult breathing (50%), And cough was (40%) many factors can contribute to inadequate ventilation respiratory depression caused by anesthetic agent, aspiration of respiratory tract secretions or vomiting, and the patient position on operating table can compromise the exchange of gases.

Regarding Gastrointestinal complications recent study showed that nausea (71.67%) and vomiting (58%) postoperative nausea and vomiting is due to the effects of the combined factors such as the background of the patient, surgery done, anesthesia and medication used and the environmental factors patient's factors are female gender, previous postoperative nausea and vomiting history and age. In another study [29] find anesthesia related risk factors include the use of volatile anesthetics, extended time of surgery and anesthesia and postoperative opioid use anesthesia rises as a risk through the use of volatile anesthetics agents contributing to brain stimulation leading to nausea and vomiting often high doses of opioid are used for pain alleviation, and they are recognized to trigger nausea and vomiting. The constipation with percentage (68.33%). It is thought that this finding is duo to anesthetic agents and pain medication particularly by opioids administered for postoperative pain relief as these agents slow gastrointestinal motility by binding to opioid receptors in the gut and reducing peristalsis, other factors such as lack of movement observed in most patients, inability to consume fiber and whole grain products and fluid intake, colorectal/abdominal discomfort. These percentage is

approximately convergent with study [30] who found that the constipation incidence rate was found to be (77.70%).

Terms of neurological complication the current study sample suggests the percentage of numbness among patients (55.00%), numbness can occur after undergoing general anesthesia, especially if the surgery is long which requires a great amount of anesthesia, this group of medicines is used to blunt pain and sensation during surgery. It can lead to nerve damage that causes numbness. Anesthesia causes numbness on purpose. And it can last for hours or even days after surgery. Our results are in agreement with those of [31] who reported that (37.00%) of patients reported having experienced some form of numbness after surgery.

Throughout the course of data analysis of the current research, the result in chart (3.1) appears the highest percentages of complication in the cardiovascular system is hypotension (41.7%), this finding can occur due to a variety of factors such as reduce cardiac output, hypovolemia, time of fasting before surgery and vasodilatation. This result is consistent with the findings of [32]. Which found the incidence of post operative hypotension on the remaining day of surgery was more than (30.0%). This result is accordance with the study [29] who reported that hypotension was seen in (29.0%) of cases.

There is low percent in urinary incontinence and dysuria with (20%) and (16.67%) respectively this problem depends on the type of surgery like kidney surgery, another study done by [33] found that the percentage of micturition problems was (9.3%)

Regarding to the general complications the result show that headache is the most common with (82%) from all sample It may be cause due to noise, change in blood pressure, side effect of medication or dehydration. Another study found that (33%) have postoperative patient had headache [29]. We also documented a (55%) incidence of back pain which was higher than observed in other studies. [33] who found the percentage of back pain was (17%).

Pain of muscles was (35%) these symptoms can be attributed to several factors like paralytic medications, which are powerful muscle relaxants used during GA, can cause muscle aches. Additionally, lying still in one position for the duration of the surgery can contribute to soreness. Back Pain: The inability to shift positions during surgery often leads to back pain, as the body remains in a fixed position for an extended period. This touches with the finding of [3], the high present of back pain and muscle pain is very effect of motor deficit make it with high incidence (61.67%) Back pain and muscle pain after general anesthesia (GA) are common complaints.

The researcher found that (51.67%) of patient have postoperative hyperthermia. This may be due to longer duration of preoperative fasting, and inability to eat and drink postoperatively leading to dehydration. This result touch study by [34] have also reported the temperature elevation in fever in 45% of cases.

The researcher found that feeling cold or chills in (68.33%) of postoperative patient another study say that postoperative shivering is a frequent complication of anesthesia; it has been reported to range from 20 to 70% in general anesthesia [35].

Part III relationship between patient who have previous surgery's and who have not surgery

In tables 3-8 show that is no significant between patient who have previous surgery and who haven't. This result is incongruent with the study done by [31] who found that there was statistically no significant difference between patient who had previous surgery (62%) and those who did not undergo previous surgery (38%) regarding their assessment about general anesthesia, types, complication, and role of anesthesiologist both inside and outside operational therapy.

Part IV Association between the overall assessment of patients' complications and their demographic data

Concerning the table 9 the P value was ($P < 0.05$) between respiratory complications and their gender and marital status, differences between genders may affect the risk of respiratory complications after general anesthesia, such as hormonal differences and percentage of smoking. Marital status reflects the level of social support, which can influence recovery after surgery. And the P value between respiratory complications and their age ($p < 0.05$), with older patients more susceptible due to physiological changes and comorbidities.

Regarding the table 10 show only one significant ($P < 0.05$) between gastrointestinal complications and their demographic data this significant only in residence. it may be because Socioeconomic status, often correlated with residence, can influence diet and overall health, which may affect recovery and the risk of complications after surgery and the environment where one resides, such as areas with high pollution, might impact pre-existing health conditions, which could contribute to postoperative complications.

Concerning the table 11 show association between the overall assessment of patients' cardiac complications and their demographic data that significant with gender and residence in Gender: Differences in physiology, hormones, and lifestyle between male and females can contribute to this variance. Residence: The place of residence can affect access to healthcare and environmental conditions, which in turn can impact the risk of cardiac complications.

CONCLUSION

Fundamental Finding : The present study revealed several key findings regarding postoperative complications among surgical patients. A significant majority of the patients were female (80%), and two-thirds had diabetes or had undergone previous surgeries (66.7%). Among the complications observed after general anesthesia, the most common were headache, nausea, chills, constipation, and motor deficits. However, there was no statistical correlation between patients with and without previous surgeries. The analysis also identified a highly significant association between respiratory complications and demographic variables such as age and gender, while associations between other complications (nervous, urinary, and general systems) and demographic data were not statistically significant. **Implication :** The findings highlight the importance of personalized preoperative assessments and targeted patient education. The significant

link between respiratory complications and demographic factors underscores the need to tailor perioperative care, especially for older and female patients. Furthermore, the high incidence of certain complications such as headache and nausea calls for improved pain management protocols and better communication with patients regarding what to expect post-surgery. These insights can guide healthcare professionals in implementing strategies to enhance patient safety and satisfaction before and after anesthesia.

Limitation : This study had several limitations. It involved a relatively limited sample size, which may affect the generalizability of the results. The focus was primarily on observable complications, without in-depth exploration of biochemical or psychological variables. Additionally, the study relied on patient-reported outcomes, which may introduce bias or inaccuracies in reporting symptoms and experiences. The cross-sectional design also limits the ability to establish causal relationships between demographic characteristics and complication rates. **Future Research :** Future research should expand on these findings by conducting longitudinal studies with larger, more diverse populations to confirm and elaborate on the observed trends. Investigations could explore the role of other potential risk factors, such as pre-existing comorbidities or medication use, in predicting anesthesia-related complications. Additionally, research into intervention strategies, including preoperative education, advanced pain control methods, and staff training programs, may contribute to reducing postoperative discomfort and improving patient outcomes. Studies should also assess the effectiveness of follow-up care models in managing late-appearing symptoms like constipation and nausea.

REFERENCES

- [1] N. Huq, *Local Anesthesia for Plastic Surgery, An Issue of Clinics in Plastic Surgery*, vol. 40, no. 4. Elsevier Health Sciences, 2013.
- [2] B. Hadder, "Pulmonary Complications after General Anesthesia," 2013.
- [3] A. Afroz, R. U. Khan, and C. S. Kormokar, "General Anesthesia Complications in Different Surgeries: A Single Center Study in Bangladesh," *Saudi J Med*, vol. 8, no. 1, pp. 18–23, 2023.
- [4] P. Paul and B. Williams, *Canadian textbook of medical-surgical nursing*. Wolters Kluwer Health | Lippincott Williams & Wilkins, 2016.
- [5] L. S. Williams and P. D. Hopper, *Understanding medical surgical nursing*. FA Davis, 2015.
- [6] L. S. Brunner, S. C. Smeltzer, B. G. Bare, J. L. Hinkle, and K. H. Cheever, *Brunner & Suddarth's Textbook of Medical-surgical Nursing*. Wolters Kluwer Health/Lippincott Williams & Wilkins, 2010. [Online]. Available: <https://books.google.iq/books?id=SmtjSD1x688C>
- [7] A. C. Adler and M. Raghavendra (Raghu), "General Anesthesia," in *Medscape*, 2018.
- [8] J. N. Kumar and P. Ravi, "Postoperative Care of the Maxillofacial Surgery Patient," in *Oral and Maxillofacial Surgery for the Clinician*, 2021, pp. 239–255.
- [9] L. Niemi-Murola, J. Jalonen, E. Junttila, K. Metsävainio, and R. Pöyhiä, *Anestesiologian ja tehohoidon perusteet*. Helsinki: Kustannus Oy Duodecim, 2012.
- [10] P. Brander and T. Varpula, "Keuhkosairaudet. Hengitysvajaus. Kaasujenvaihtohäiriö," 2014, *Kustannus Oy Duodecim*.
- [11] H. Kehlet and J. B. Dahl, "Anaesthesia, surgery, and challenges in postoperative recovery," *Lancet*, vol. 362, no. 9399, pp. 1921–1928, 2003.
- [12] L. Paavolainen and J. Wallstedt, "Post-operative complications of general anesthesia: a recorded video presentation," 2016.
- [13] J. L. Hinkle and K. H. Cheever, *Study guide for Brunner & Suddarth's textbook of medical-*

- surgical nursing*. Lippincott Williams & Wilkins, 2013.
- [14] S. Mert, "The Significance of Nursing Care in the Post-anesthesia Care Unit and Barriers to Care," *Intensive Care Res.*, pp. 1–10, 2023.
 - [15] D. Rudolphi, "Postoperative care," in *Lewis's Medical-Surgical Nursing*, 12th ed., M. M. Harding, J. Kwong, D. Hagler, and C. Reinisch, Eds., Elsevier, 2023.
 - [16] D. Hagler, C. Reinisch, M. M. Harding, and J. Kwong, *Lewis's Medical-Surgical Nursing E-Book: Assessment and Management of Clinical Problems, Single Volume*. Elsevier Health Sciences, 2022.
 - [17] B. Gurel and S. Koçalışlı, "Recovery quality and nursing care of postoperative patients," *Türkiye Sağlık Bilim ve Araştırmaları Derg.*, vol. 5, no. 1, pp. 12–30, 2022.
 - [18] A. D. Kane *et al.*, "The incidence of potentially serious complications during non-obstetric anaesthetic practice in the United Kingdom: an analysis from the 7th National Audit Project (NAP7) activity survey," *Anaesthesia*, vol. 79, no. 1, pp. 43–53, 2024.
 - [19] A. D. Kane, R. A. Armstrong, E. Kursumovic, T. M. Cook, and J. Soar, "The 7th UK National Audit Project (NAP7). The challenges of defining, studying and learning from peri-operative cardiac arrest," *Anaesthesia*, vol. 76, no. 8, pp. 1026–1030, 2021.
 - [20] J. Ohta, T. Suto, D. Kato, T. Hiroki, H. Obata, and S. Saito, "Loss of endogenous analgesia leads to delayed recovery from incisional pain in a rat model of chronic neuropathic pain," *Brain Res.*, vol. 1727, p. 146568, 2020.
 - [21] C. P. L. Jones, J. Fawker-Corbett, P. Groom, B. Morton, C. Lister, and S. J. Mercer, "Human factors in preventing complications in anaesthesia: a systematic review," *Anaesthesia*, vol. 73, pp. 12–24, 2018.
 - [22] L. Tiret, F. Hatton, J. M. Desmonts, and G. Vourc'h, "Prediction of outcome of anaesthesia in patients over 40 years: a multifactorial risk index," *Stat. Med.*, vol. 7, no. 9, pp. 947–954, 1988.
 - [23] M. Naguib, M. M. A. Magboul, and R. Jaroudi, "Adverse effects of general anaesthetics: Incidence and therapeutic implications," *CNS Drugs*, vol. 10, pp. 119–144, 1998.
 - [24] G. Li, M. Warner, B. H. Lang, L. Huang, and L. S. Sun, "Epidemiology of anesthesia-related mortality in the United States, 1999–2005," *J. Am. Soc. Anesthesiol.*, vol. 110, no. 4, pp. 759–765, 2009.
 - [25] A. C. Silva, F. O'Ryan, and D. B. Poor, "Postoperative nausea and vomiting (PONV) after orthognathic surgery: a retrospective study and literature review," *J. Oral Maxillofac. Surg.*, vol. 64, no. 9, pp. 1385–1397, 2006.
 - [26] E. E. Dencker, A. Bonde, A. Troelsen, K. M. Varadarajan, and M. Sillesen, "Postoperative complications: an observational study of trends in the United States from 2012 to 2018," *BMC Surg.*, vol. 21, no. 1, p. 393, 2021.
 - [27] M. M. A. Kreem and R. A.-H. Hamza, "Effectiveness of educational program on nurses' knowledge regarding pre and post-operative nursing management," *Int. J. Public Heal. Res. Dev.*, vol. 10, no. 01, p. 964, 2019.
 - [28] G. Umpierrez *et al.*, "Randomized controlled trial of intensive versus conservative glucose control in patients undergoing coronary artery bypass graft surgery: GLUCO-CABG trial," *Diabetes Care*, vol. 38, no. 9, pp. 1665–1672, 2015.
 - [29] P. A. Lone, N. A. Wani, Q. ul Ain, A. Heer, R. Devi, and S. Mahajan, "Common postoperative complications after general anesthesia in oral and maxillofacial surgery," *Natl. J. Maxillofac. Surg.*, vol. 12, no. 2, pp. 206–210, 2021.
 - [30] B. Celik and Ö. Bilik, "Postoperative constipation ruincidence and effects of selected risk factors on constipation development in elderly patients with hip fracture," *Orthop. Nurs.*, vol. 41, no. 6, pp. 397–405, 2022.
 - [31] V. Marulasiddappa and H. N. Nethra, "A survey on awareness about the role of anesthesia and anesthesiologists among the patients undergoing surgeries in a tertiary care teaching women and children hospital," *Anesth. Essays Res.*, vol. 11, no. 1, pp. 144–150, 2017.
 - [32] P. Hoppe, K. Kouz, and B. Saugel, "Perioperative hypotension: clinical impact, diagnosis, and therapeutic approaches," *J. Emerg. Crit. Care Med.*, vol. 4, p. 8, 2020.

- [33] I. Tennant *et al.*, "Minor postoperative complications related to anesthesia in elective gynecological and orthopedic surgical patients at a teaching hospital in Kingston, Jamaica," *Rev. Bras. Anesthesiol.*, vol. 62, pp. 193–198, 2012.
- [34] M. Victoria, F. A. Carvalho-Costa, M. B. Heinemann, J. P. Leite, and M. Miagostovich, "Prevalence and molecular epidemiology of noroviruses in hospitalized children with acute gastroenteritis in Rio de Janeiro, Brazil, 2004," *Pediatr. Infect. Dis. J.*, vol. 26, no. 7, pp. 602–606, 2007.
- [35] L. H. J. Eberhart *et al.*, "Independent risk factors for postoperative shivering," *Anesth. Analg.*, vol. 101, no. 6, pp. 1849–1857, 2005.

Mariam Mohammed Ali Kareem

University of Kufa, Iraq

Ali Fadel Abbas

University of Kufa, Iraq

Nada Jassem Yassien

University of Kufa, Iraq

Thuraya Ali Baseer

University of Kufa, Iraq

Layla Raheem Hakem

University of Kufa, Iraq
