

# Awareness about the Role of Anesthesiologists among Healthcare Workers in the Eastern Province of Saudi Arabia

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## Abstract

Anesthesia is still considered a modern medical discipline, and the role of anesthesiologists is an undervalued subject and relatively unknown neither by healthcare workers nor by the general population. This study aimed to evaluate the level of awareness about the role of anesthesiologists among healthcare workers not working with this specialty in the Eastern Province of Saudi Arabia. A total of 377 healthcare workers from various healthcare settings participated in the study. The results showed that the majority of participants correctly identified the anesthesiologist as the responsible party for different aspects of anesthesia management. However, a small percentage of participants identified other healthcare professionals as responsible for these tasks, and in some cases, participants responded that they did not know who was responsible. The study also found that job titles significantly affected the level of knowledge about anesthesia care. Overall, the study highlights the need for increased awareness and education about the role of anesthesiologists among healthcare workers.

**Keywords:** Anesthesia, Role of anesthesiologists, Knowledge, Healthcare workers

## INTRODUCTION

Anesthesiology has undergone a revolution over the past 150 years as its profession has grown by leaps and bounds [1, 2]. In recent decades, anesthesia has moved far beyond the usual operating room, with anesthesiologists involved in crucial activities such as pain management, critically ill patient management, palliative care, and emergency care. Additionally, the Anesthesiologist is recognized as the backbone of the resuscitation team [3]. However, in the eyes of the public and other health workers, anesthesiologists are not getting what they deserve [4].

There have been numerous surveys done before to assess the awareness of the general population about the role of anesthesiologists among the public population and patients undergoing elective surgery. However, there are a limited number of studies that assess the perception of anesthesiologists among healthcare workers none of them done in Saudi Arabia. A cross-sectional study was Published on 21 April 2022 about The Perception of the Anesthesiologist Among the Medical, Paramedical, and Administrative Staff who work in this specialty in Normandy, France by using a survey validated by a semi-directive interview methodology, and the study concludes that the overall perception of the anesthesiologist in their study appears to be good [5].

It is generally believed to be a 'behind the screen' specialty, in which the Anesthesiologist has only an accessory role while he plays a crucial role in many aspects, including preoperative care, intensive care, pain clinic, and labor analgesia [6, 7]. The study's objective is to evaluate the level of awareness about the role of anesthesiologists among healthcare workers not working in this specialty in Saudi Arabia.

## MATERIALS AND METHODS

The study was designed as a national survey conducted in Saudi Arabia. The study lasted for six months, based on the

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estimated sample size and response rate. The selection criteria included non-anesthesiologist physicians, non-operation theater nurses, non-anesthesia technologists, paramedics, medical secretaries, and interns. The exclusion criteria included anesthesiologists, anesthesia technologists, operation theater nurses, and non-healthcare workers. The sample size was 369, with a 95% confidence level and a margin of error of 5%. The Independent variables in this study are age, gender, nationality, job, and number of years of practice. The Dependent variables are the knowledge of the role of anesthesiologists and the awareness of participants about facts related to anesthesiologists

**Data Collection and Instrument**

An internet-based, national survey was conducted among Saudi and non-Saudi non-anesthesiologists' healthcare workers in the eastern province. The questionnaire was modified from questionnaires used in two studies conducted in France and Korea [5, 8]. It was piloted by a selected group of experts for readability, practicability, presentation, acceptability, and generalizability. The final questionnaire was created after addressing comments and modifications.

The primary outcome was to examine the awareness of Saudi and non-Saudi healthcare workers regarding the roles and responsibilities of anesthesiologists (preoperative, intraoperative, and postoperative). The secondary outcomes included the image of the healthcare workers about anesthesiologists and the workload on anesthesiologists. The questionnaire was written in English and conducted on the SurveyMonkey® internet platform. All submitted data were encrypted. Ethical approval for the study was sought from the IRB.

A 28-item questionnaire in addition to participants' characteristics including age, gender, nationality, number of years of practice, work location, city, and department was administered. Questions and answers in the questionnaire were structured using the BRUSO approach (brief, relevant, unambiguous, specific, and objective).

All healthcare workers who worked in governmental and non-governmental Saudi hospitals including anesthesia service coverage were eligible for participation. The survey was uploaded to the SurveyMonkey® platform. The URL link to the questionnaire was distributed to healthcare workers by e-mail invitations sent out by the investigators as well as personal and social networking platforms. A 'snowballing' sampling technique was used. Weekly reminders were sent until the planned minimum number of respondents required was reached.

Email invitations included information about the aims and objectives of the survey, data handling, management, and privacy rights. All participants were asked to provide consent for participation and data analysis which were voluntary and anonymous. Completion of the questionnaire was only

possible after consent had been provided. Respondents were asked to complete all the questions in the questionnaire without omitting any answers. There were no identifiers that could link to the individual participant. All data collected were kept anonymous, secure, and confidential in the archiving system of the center of the coordinating investigator.

**Statistical Analysis**

The IBM SPSS Statistics Subscription, version 26, was used for statistical analysis. Data management and descriptive statistics (number, percentages, mean [standard deviation] or median [interquartile range]) were performed according to the normality of the data.

**RESULTS AND DISCUSSION**

(Table 1) presents the sociodemographic characteristics of the study participants (n=377). The majority of the participants were aged between 25-34 years (44.3%), and female (65.3%). Almost all participants were Saudi nationals (96.6%) and worked in various healthcare settings in the Eastern Province of Saudi Arabia. The majority of participants worked in university hospitals (33.2%) and the most common city of practice was Dammam (24.9%). Most institutions had anesthesia facilities (87.3%) and skilled and experienced anesthesiologists around the clock (82.5%).

**Table 1. Sociodemographic characters of the participants (n=377)**

Parameter	Frequency (%)
Age	20-24 116 (30.8%)
	25-34 167 (44.3%)
	35-44 62 (16.4%)
	45-54 18 (4.8%)
	55-64 14 (3.7%)
Gender	Female 246 (65.3%)
	Male 131 (34.7%)
Nationality	Non-Saudi 13 (3.4%)
	Saudi 364 (96.6%)
Currently, you work in	Primary health care 22 (5.8%)
	Private hospital 42 (11.1%)
	Secondary care hospital 109 (28.9%)
	Tertiary care hospital 79 (21%)
	University Hospital 125 (33.2%)
Currently, you work in which city of the eastern province	Al has 27 (7.2%)
	Dammam. 94 (24.9%)
	Dhahran 29 (7.7%)
	Hafar Al Batin 10 (2.7%)
	Jubail 42 (11.1%)
	Khafji 7 (1.9%)
Khobar 89 (23.6%)	

	Qatif	72 (19.1%)
	Ras Tanura	7 (1.9%)
Does your institution have anesthesia facilities?	No	48 (12.7%)
	Yes	329 (87.3%)
Does your institution have skilled and experienced anesthesiologists around the clock :	No	66 (17.5%)
	Yes	311 (82.5%)
Currently, you work in which department	Dermatology	4 (1.1%)
	ER	43 (11.4%)
	Family Medicine	51 (13.5%)
	ICU	14 (3.7%)
	Internal Medicine	54 (14.3%)
	Neurology	2 (0.5%)
	NICU	8 (2.1%)
	Obstetric and Gynecology	46 (12.2%)
	Ophthalmology	10 (2.7%)
	Pathology	8 (2.1%)
	Pediatric	31 (8.2%)
	Pharmacy	17 (4.5%)
	Physiotherapy	4 (1.1%)
	Psychiatry	7 (1.9%)
	Radiology	14 (3.7%)
	Respiratory Care	8 (2.1%)
	Surgery and Surgical subspeciality	56 (14.9%)
	Consultant	44 (11.7%)
	General Practitioner	21 (5.6%)
	Job	Intern
Nurse		44 (11.7%)
Pharmacist		14 (3.7%)
Resident		88 (23.3%)
Specialist		46 (12.2%)
Number of years of practice	<1	173 (45.9%)
	>30	8 (2.1%)
	1-4	90 (23.9%)
	11-20	37 (9.8%)
	21-30	18 (4.8%)

5-10 51 (13.5%)

The participants worked in a wide range of departments, with the highest proportion working in internal medicine (14.3%) and the lowest in neurology (0.5%). The majority of participants were interns (31.8%) or had less than one year of practice experience (45.9%) see (Figure 1). Between the groups regarding this awareness item (P=0.744).

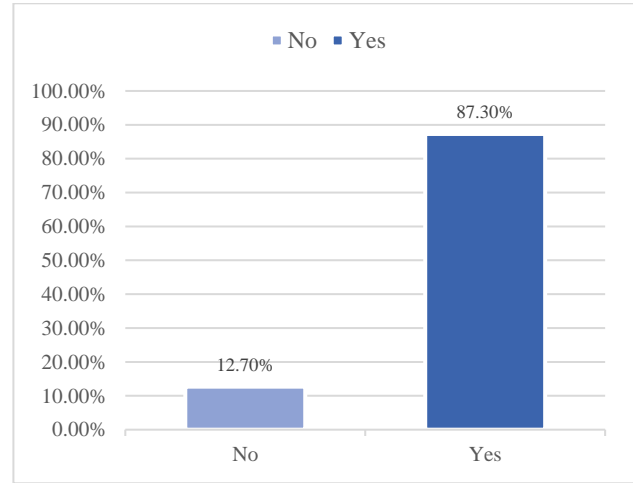


Figure 1. Does your institution have anesthesia facilities

The results presented in (Table 2) show the participants' knowledge of the roles of anaesthesiologists in various aspects of patient care. Overall, the majority of participants (ranging from 41.9% to 84.9%) correctly identified the anaesthesiologist as the responsible party for the different aspects of anesthesia management, such as administering anesthesia, determining patient fitness, deciding on the type of anesthesia, and inserting an epidural catheter for pain management during labor. In contrast, a small percentage of participants identified other healthcare professionals, such as surgeons, nurses, or anesthesia technologists, as responsible for these tasks. In some cases, a significant proportion of participants responded that they did not know who was responsible, such as in the case of managing immediate postoperative complications or covering the pain clinic for chronic pain patients.

Table 2. Knowledge of roles of anaesthesiologists (n=377)

Knowledge Item/Response	Surgeon	Anaesthesiologist	Anesthesia technologist	Nurse	Don't know
Who is in charge of giving anesthesia to patients during surgery?	19 (5%)	300 (79.6%)	49 (13%)	3 (0.8%)	6 (1.6%)
Who will determine the fitness of patients for the planned surgery?	62 (16.4%)	294 (78%)	10 (2.7%)	3 (0.8%)	8 (2.1%)
The type of anesthesia will be decided by:	45 (11.9%)	320 (84.9%)	9 (2.4%)	1 (0.3%)	2 (0.5%)
The period of fasting before the operation should be determined by:	72 (19.1%)	281 (74.5%)	13 (3.4%)	5 (1.3%)	6 (1.6%)
In the operation room which doctors should be in charge?	64 (17%)	293 (77.7%)	15 (4%)	3 (0.8%)	2 (0.5%)
Who is responsible for administering the anesthetic drugs and fluids during an operation?	17 (4.5%)	303 (80.4%)	0 (0%)	47 (12.5%)	10 (2.7%)

Monitors vital signs during an operation done by:	20 (5.3%)	268 (71.1%)	0 (0%)	79 (21%)	10 (2.7%)
Estimation of blood loss during an operation done by:	148 (39.3%)	158 (41.9%)	0 (0%)	62 (16.4%)	9 (2.4%)
Who is responsible for blood transfusions if needed during an operation?	97 (25.7%)	193 (51.2%)	0 (0%)	72 (19.1%)	15 (4%)
If resuscitation is needed for the patient during operation Who will lead the CPR?	99 (26.3%)	231 (61.3%)	0 (0%)	19 (5%)	28 (7.4%)
Who is responsible for the smooth recovery of the patient after surgery?	59 (15.6%)	243 (64.5%)	0 (0%)	63 (16.7%)	12 (3.2%)
Who is responsible for managing pain in the recovery area?	54 (14.3%)	242 (64.2%)	0 (0%)	69 (18.3%)	12 (3.2%)
Managing postoperative period immediate complications responsibility of:	168 (44.6%)	164 (43.5%)	0 (0%)	24 (6.4%)	21 (5.6%)
choose Who is responsible for inserting an epidural catheter to manage labor pain in the delivery room?	32 (8.5%)	315 (83.6%)	0 (0%)	19 (5%)	11 (2.9%)
choose [Who is covering pain clinic for chronic pain patients?]	46 (12.2%)	261 (69.2%)	0 (0%)	29 (7.7%)	41 (10.9%)

(Table 3) presents the awareness of participants regarding various facts related to anesthesiologists. The data shows that the majority of participants strongly agree or agree that anaesthesiologists are service providers (82.2%), members of the resuscitation team in the hospital (78%), have an activity with a high degree of responsibility (87.3%), have important

decision power for patient management in the operation room (84.3%), and can manage all types of emergencies (54.4%). However, only a minority of participants strongly agree or agree that anaesthesiologists are recognized by patients (51.2%) and have double competence in anesthesia and intensive care (70%).

**Table 3.** Awareness of participants of facts related to anaesthesiologists (n=377)

Parameter: The anesthesiologists	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Service provider	156 (41.4%)	154 (40.8%)	50 (13.3%)	10 (2.7%)	7 (1.9%)
General practitioner in the surgery sector.	82 (21.8%)	105 (27.9%)	87 (23.1%)	63 (16.7%)	40 (10.6%)
Member of the Resuscitation Team in the hospital.	174 (46.2%)	120 (31.8%)	67 (17.8%)	11 (2.9%)	5 (1.3%)
Has an activity with a high degree of responsibility	230 (61%)	99 (26.3%)	40 (10.6%)	8 (2.1%)	0 (0%)
Has an important decision power for patient management in the operating room	207 (54.9%)	111 (29.4%)	50 (13.3%)	9 (2.4%)	0 (0%)
Will be recognized by the patient	87 (23.1%)	106 (28.1%)	96 (25.5%)	63 (16.7%)	25 (6.6%)
Has double competence in anesthesia and intensive care	136 (36.1%)	146 (38.7%)	80 (21.2%)	14 (3.7%)	1 (0.3%)
Can manage all types of emergencies.	96 (25.5%)	109 (28.9%)	118 (31.3%)	48 (12.7%)	6 (1.6%)
<b>The Workplace</b>					
Has a significant workload	138 (36.6%)	144 (38.2%)	79 (21%)	13 (3.4%)	3 (0.8%)
Can be confronted with potential conflict relationship with the surgeon	117 (31%)	167 (44.3%)	82 (21.8%)	10 (2.7%)	1 (0.3%)
Exposed to stress generating situation	162 (43%)	134 (35.5%)	65 (17.2%)	15 (4%)	1 (0.3%)
Expose to the risk of burnout	149 (39.5%)	127 (33.7%)	81 (21.5%)	20 (5.3%)	0 (0%)
Take a central position in the operating room	146 (38.7%)	122 (32.4%)	82 (21.8%)	23 (6.1%)	4 (1.1%)
Has double competence in anesthesia and intensive care.	144 (38.2%)	120 (31.8%)	83 (22%)	25 (6.6%)	5 (1.3%)
Can manage all types of emergencies	141 (37.4%)	128 (34%)	82 (21.8%)	22 (5.8%)	4 (1.1%)

(Table 4) presents the job titles of participants with their knowledge items. The study aimed to determine the level of knowledge of healthcare professionals about the roles of different healthcare professionals in anesthesia care. A total of 377 participants were included in the study. The first knowledge item asked, "Who is in charge of giving anesthesia to patients during surgery?" Anesthesiologists received the most responses from interns (32.7%), followed by residents

(24%) and consultants (14%). The lowest percentage was found among GPs (5.7%) and pharmacists (3.3%). The p-value was found significant (p=0.004), indicating that the participants' job titles significantly affected their answers. The second knowledge item asked, "Who will determine the fitness of patients for the planned surgery?" The highest percentage of correct answers was found among interns (33%), followed by residents (27.6%) and consultants

(14.6%). GP and pharmacists had the lowest correct answer rates with 5.1% and 2%, respectively. The p-value was found significant (p=0.000). The third knowledge item asked, "Type of anesthesia will be decided by." Interns had the highest correct answer rate (31.6%), followed by residents (24.4%)

and consultants (13.8%). GP and pharmacists had the lowest correct answer rates with 5.6% and 2.8%, respectively. The p-value was also found significant (p=0.013), indicating that job titles significantly affected the answers to this question.

**Table 4.** Job title of participants in association with knowledge items (n=377)

Parameter		Position							P-value
		Consultant	GP	Intern	Nurse	Pharmacist	Resident	Specialist	
Who is in charge of giving anesthesia to patients during surgery?	A- Surgeon	0 (0%)	1 (5.3%)	4 (21.1%)	3 (15.8%)	0 (0%)	4 (21.1%)	7 (36.8%)	0.004
	B- Anesthesiologist	42 (14%)	17 (5.7%)	98 (32.7%)	28 (9.3%)	10 (3.3%)	72 (24%)	33 (11%)	
	C- Anesthesia technologist	2 (4.1%)	2 (4.1%)	17 (34.7%)	10 (20.4%)	3 (6.1%)	11 (22.4%)	4 (8.2%)	
	D- Nurse.	0 (0%)	0 (0%)	0 (0%)	2 (66.7%)	1 (33.3%)	0 (0%)	0 (0%)	
	Don't know	0 (0%)	1 (16.7%)	1 (16.7%)	1 (16.7%)	0 (0%)	1 (16.7%)	2 (33.3%)	
Who will determine the fitness of patients for the planned surgery?	A- Surgeon	1 (1.6%)	5 (8.1%)	18 (29%)	13 (21%)	7 (11.3%)	4 (6.5%)	14 (22.6%)	0.000
	B- Anesthesiologist	43 (14.6%)	15 (5.1%)	97 (33%)	23 (7.8%)	6 (2%)	81 (27.6%)	29 (9.9%)	
	C- Anesthesia technologist	0 (0%)	0 (0%)	2 (20%)	5 (50%)	0 (0%)	2 (20%)	1 (10%)	
	D- Nurse.	0 (0%)	0 (0%)	0 (0%)	2 (66.7%)	0 (0%)	0 (0%)	1 (33.3%)	
	Don't know	0 (0%)	1 (12.5%)	3 (37.5%)	1 (12.5%)	1 (12.5%)	1 (12.5%)	1 (12.5%)	
The type of anesthesia will be decided by:	A- Surgeon	0 (0%)	2 (4.4%)	15 (33.3%)	7 (15.6%)	3 (6.7%)	8 (17.8%)	10 (22.2%)	0.013
	B- Anesthesiologist	44 (13.8%)	18 (5.6%)	101 (31.6%)	34 (10.6%)	9 (2.8%)	78 (24.4%)	36 (11.3%)	
	C- Anesthesia technologist	0 (0%)	0 (0%)	3 (33.3%)	2 (22.2%)	2 (22.2%)	2 (22.2%)	0 (0%)	
	D- Nurse.	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	
	Don't know	0 (0%)	1 (50%)	1 (50%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	
The period of fasting before the operation should be determined by:	A- Surgeon	0 (0%)	3 (4.2%)	22 (30.6%)	16 (22.2%)	5 (6.9%)	17 (23.6%)	9 (12.5%)	0.001
	B- Anesthesiologist	44 (15.7%)	16 (5.7%)	92 (32.7%)	21 (7.5%)	6 (2.1%)	67 (23.8%)	35 (12.5%)	
	C- Anesthesia technologist	0 (0%)	1 (7.7%)	4 (30.8%)	4 (30.8%)	1 (7.7%)	2 (15.4%)	1 (7.7%)	
	D- Nurse.	0 (0%)	0 (0%)	1 (20%)	2 (40%)	1 (20%)	0 (0%)	1 (20%)	
	Don't know	0 (0%)	1 (16.7%)	1 (16.7%)	1 (16.7%)	1 (16.7%)	2 (33.3%)	0 (0%)	
In the operation room which doctors should be in charge?	A- Surgeon	2 (3.1%)	3 (4.7%)	20 (31.3%)	10 (15.6%)	5 (7.8%)	16 (25%)	8 (12.5%)	0.366
	B- Anesthesiologist	41 (14%)	17 (5.8%)	95 (32.4%)	30 (10.2%)	9 (3.1%)	68 (23.2%)	33 (11.3%)	
	C- Anesthesia technologist	1 (6.7%)	1 (6.7%)	4 (26.7%)	3 (20%)	0 (0%)	2 (13.3%)	4 (26.7%)	
	D- Nurse.	0 (0%)	0 (0%)	1 (33.3%)	1 (33.3%)	0 (0%)	0 (0%)	1 (33.3%)	
	Don't know	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (100%)	0 (0%)	
Who is responsible for administering the anesthetic drugs and fluids during an operation?	A- Surgeon	0 (0%)	0 (0%)	6 (35.3%)	1 (5.9%)	1 (5.9%)	3 (17.6%)	6 (35.3%)	0.237
	B- Anesthesiologist	39 (12.9%)	18 (5.9%)	98 (32.3%)	34 (11.2%)	9 (3%)	74 (24.4%)	31 (10.2%)	
	D- Nurse.	4 (8.5%)	2 (4.3%)	12 (25.5%)	9 (19.1%)	3 (6.4%)	9 (19.1%)	8 (17%)	
	Don't know	1 (10%)	1 (10%)	4 (40%)	0 (0%)	1 (10%)	2 (20%)	1 (10%)	
Monitors vital signs during an operation done by:	A- Surgeon	0 (0%)	0 (0%)	6 (30%)	3 (15%)	3 (15%)	4 (20%)	4 (20%)	0.000
	B- Anesthesiologist	37 (13.8%)	15 (5.6%)	92 (34.3%)	18 (6.7%)	7 (2.6%)	70 (26.1%)	29 (10.8%)	
	D- Nurse.	7 (8.9%)	5 (6.3%)	18 (22.8%)	21 (26.6%)	2 (2.5%)	13 (16.5%)	13 (16.5%)	
	Don't know	0 (0%)	1 (10%)	4 (40%)	2 (20%)	2 (20%)	1 (10%)	0 (0%)	
Estimation of blood loss during an operation done by:	A- Surgeon	16 (10.8%)	10 (6.8%)	51 (34.5%)	15 (10.1%)	6 (4.1%)	35 (23.6%)	15 (10.1%)	0.092
	B- Anesthesiologist	22 (13.9%)	8 (5.1%)	49 (31%)	11 (7%)	4 (2.5%)	42 (26.6%)	22 (13.9%)	
	D- Nurse.	6 (9.7%)	2 (3.2%)	17 (27.4%)	16 (25.8%)	3 (4.8%)	9 (14.5%)	9 (14.5%)	
	Don't know	0 (0%)	1 (11.1%)	3 (33.3%)	2 (22.2%)	1 (11.1%)	2 (22.2%)	0 (0%)	

Who is responsible for blood transfusions if needed during an operation?	A- Surgeon	12 (12.4%)	7 (7.2%)	33 (34%)	9 (9.3%)	7 (7.2%)	16 (16.5%)	13 (13.4%)	0.000
	B- Anesthesiologist	32 (16.6%)	7 (3.6%)	55 (28.5%)	15 (7.8%)	2 (1%)	58 (30.1%)	24 (12.4%)	
	D- Nurse.	0 (0%)	5 (6.9%)	24 (33.3%)	19 (26.4%)	4 (5.6%)	12 (16.7%)	8 (11.1%)	
	Don't know	0 (0%)	2 (13.3%)	8 (53.3%)	1 (6.7%)	1 (6.7%)	2 (13.3%)	1 (6.7%)	
If resuscitation is needed for the patient during operation Who will lead the CPR?	A- Surgeon	2 (2%)	9 (9.1%)	41 (41.4%)	14 (14.1%)	5 (5.1%)	15 (15.2%)	13 (13.1%)	0.000
	B- Anesthesiologist	42 (18.2%)	7 (3%)	67 (29%)	19 (8.2%)	4 (1.7%)	65 (28.1%)	27 (11.7%)	
	D- Nurse.	0 (0%)	0 (0%)	4 (21.1%)	7 (36.8%)	3 (15.8%)	3 (15.8%)	2 (10.5%)	
	Don't know	0 (0%)	5 (17.9%)	8 (28.6%)	4 (14.3%)	2 (7.1%)	5 (17.9%)	4 (14.3%)	
Who is responsible for the smooth recovery of patients after surgery?	A- Surgeon	1 (1.7%)	2 (3.4%)	25 (42.4%)	9 (15.3%)	2 (3.4%)	12 (20.3%)	8 (13.6%)	0.000
	B- Anesthesiologist	39 (16%)	15 (6.2%)	73 (30%)	13 (5.3%)	9 (3.7%)	66 (27.2%)	28 (11.5%)	
	D- Nurse.	4 (6.3%)	3 (4.8%)	15 (23.8%)	22 (34.9%)	2 (3.2%)	9 (14.3%)	8 (12.7%)	
	Don't know	0 (0%)	1 (8.3%)	7 (58.3%)	0 (0%)	1 (8.3%)	1 (8.3%)	2 (16.7%)	
Who is responsible for managing pain in the recovery area?	A- Surgeon	5 (9.3%)	4 (7.4%)	18 (33.3%)	5 (9.3%)	3 (5.6%)	11 (20.4%)	8 (14.8%)	0.007
	B- Anesthesiologist	35 (14.5%)	12 (5%)	70 (28.9%)	22 (9.1%)	5 (2.1%)	70 (28.9%)	28 (11.6%)	
	D- Nurse.	4 (5.8%)	4 (5.8%)	25 (36.2%)	16 (23.2%)	5 (7.2%)	6 (8.7%)	9 (13%)	
	Don't know	0 (0%)	1 (8.3%)	7 (58.3%)	1 (8.3%)	1 (8.3%)	1 (8.3%)	1 (8.3%)	
Managing postoperative period immediate complications responsibility of:	A- Surgeon	18 (10.7%)	13 (7.7%)	62 (36.9%)	15 (8.9%)	6 (3.6%)	30 (17.9%)	24 (14.3%)	0.000
	B- Anesthesiologist	24 (14.6%)	5 (3%)	47 (28.7%)	16 (9.8%)	6 (3.7%)	50 (30.5%)	16 (9.8%)	
	D- Nurse.	1 (4.2%)	1 (4.2%)	2 (8.3%)	12 (50%)	1 (4.2%)	3 (12.5%)	4 (16.7%)	
	Don't know	1 (4.8%)	2 (9.5%)	9 (42.9%)	1 (4.8%)	1 (4.8%)	5 (23.8%)	2 (9.5%)	
choose [Who is responsible for inserting an epidural catheter to manage labor pain in the delivery room?]	A- Surgeon	0 (0%)	1 (3.1%)	11 (34.4%)	8 (25%)	2 (6.3%)	5 (15.6%)	5 (15.6%)	0.011
	B- Anesthesiologist	44 (14%)	18 (5.7%)	101 (32.1%)	32 (10.2%)	9 (2.9%)	78 (24.8%)	33 (10.5%)	
	D- Nurse.	0 (0%)	1 (5.3%)	4 (21.1%)	3 (15.8%)	3 (15.8%)	4 (21.1%)	4 (21.1%)	
	Don't know	0 (0%)	1 (9.1%)	4 (36.4%)	1 (9.1%)	0 (0%)	1 (9.1%)	4 (36.4%)	
choose [Who is covering pain clinic for chronic pain patients?]	A- Surgeon	5 (10.9%)	2 (4.3%)	16 (34.8%)	5 (10.9%)	2 (4.3%)	7 (15.2%)	9 (19.6%)	0.000
	B- Anesthesiologist	37 (14.2%)	14 (5.4%)	82 (31.4%)	20 (7.7%)	7 (2.7%)	76 (29.1%)	25 (9.6%)	
	D- Nurse.	0 (0%)	1 (3.4%)	4 (13.8%)	13 (44.8%)	2 (6.9%)	2 (6.9%)	7 (24.1%)	
	Don't know	2 (4.9%)	4 (9.8%)	18 (43.9%)	6 (14.6%)	3 (7.3%)	3 (7.3%)	5 (12.2%)	

(Table 5) presents the job titles of 377 participants in association with their awareness items. The results indicate that the service providers, including interns, specialists, pharmacists, residents, nurses, and consultants, had a similar level of agreement regarding the awareness items, and there was no statistically significant difference between their responses ( $p = 0.359$ ). However, the results showed a significant difference among general practitioners in the

surgery sector for the awareness items ( $p = 0.018$ ). In this group, those who strongly agreed and agreed with the awareness items were 21.7% and 27.8%, respectively, while those who disagreed or strongly disagreed with the items were 16.7% and 10.6%, respectively. For members of the Resuscitation Team, no significant difference was observed in their level of agreement with the awareness items ( $p = 0.221$ ).

**Table 5.** Job title of participants in association with awareness items (n=377)

Parameter		Position							P-value
		Consultant	GP	Intern	Nurse	Pharmacist	Resident	Specialist	
Service provider	A-strongly agree	23 (14.7%)	5 (3.2%)	49 (31.4%)	18 (11.5%)	7 (4.5%)	36 (23.1%)	18 (11.5%)	0.359
	B-agree	18 (11.7%)	10 (6.5%)	50 (32.5%)	15 (9.7%)	5 (3.2%)	35 (22.7%)	21 (13.6%)	
	C-neutral	1 (2%)	3 (6%)	18 (36%)	9 (18%)	2 (4%)	14 (28%)	3 (6%)	
	D- disagree	2 (20%)	1 (10%)	1 (10%)	1 (10%)	0 (0%)	2 (20%)	3 (30%)	
	E- strongly disagree	0 (0%)	2 (28.6%)	2 (28.6%)	1 (14.3%)	0 (0%)	1 (14.3%)	1 (14.3%)	
General practitioner in the surgery sector.	A-strongly agree	10 (12.2%)	4 (4.9%)	22 (26.8%)	18 (22%)	3 (3.7%)	11 (13.4%)	14 (17.1%)	0.018
	B-agree	11 (10.5%)	3 (2.9%)	38 (36.2%)	14 (13.3%)	5 (4.8%)	20 (19%)	14 (13.3%)	

	C-neutral	4 (4.6%)	7 (8%)	29 (33.3%)	9 (10.3%)	3 (3.4%)	26 (29.9%)	9 (10.3%)	
	D- disagree	13 (20.6%)	4 (6.3%)	18 (28.6%)	0 (0%)	2 (3.2%)	19 (30.2%)	7 (11.1%)	
	E- strongly disagree	6 (15%)	3 (7.5%)	13 (32.5%)	3 (7.5%)	1 (2.5%)	12 (30%)	2 (5%)	
	A-strongly agree	30 (17.2%)	10 (5.7%)	50 (28.7%)	17 (9.8%)	7 (4%)	39 (22.4%)	21 (12.1%)	
	B-agree	11 (9.2%)	5 (4.2%)	45 (37.5%)	15 (12.5%)	4 (3.3%)	22 (18.3%)	18 (15%)	
Member of the Resuscitation Team in the hospital.	C-neutral	2 (3%)	6 (9%)	19 (28.4%)	8 (11.9%)	2 (3%)	24 (35.8%)	6 (9%)	0.221
	D- disagree	1 (9.1%)	0 (0%)	4 (36.4%)	3 (27.3%)	1 (9.1%)	1 (9.1%)	1 (9.1%)	
	E- strongly disagree	0 (0%)	0 (0%)	2 (40%)	1 (20%)	0 (0%)	2 (40%)	0 (0%)	
	A-strongly agree	33 (14.3%)	14 (6.1%)	82 (35.7%)	19 (8.3%)	8 (3.5%)	52 (22.6%)	22 (9.6%)	
	B-agree	7 (7.1%)	3 (3%)	27 (27.3%)	20 (20.2%)	3 (3%)	23 (23.2%)	16 (16.2%)	0.052
Has an activity with a high degree of responsibility	C-neutral	3 (7.5%)	4 (10%)	10 (25%)	5 (12.5%)	2 (5%)	11 (27.5%)	5 (12.5%)	
	D- disagree	1 (12.5%)	0 (0%)	1 (12.5%)	0 (0%)	1 (12.5%)	2 (25%)	3 (37.5%)	
	A-strongly agree	30 (14.5%)	11 (5.3%)	75 (36.2%)	19 (9.2%)	8 (3.9%)	44 (21.3%)	20 (9.7%)	
Has an important decision power for patient management in the operating room	B-agree	9 (8.1%)	5 (4.5%)	29 (26.1%)	17 (15.3%)	4 (3.6%)	27 (24.3%)	20 (18%)	0.151
	C-neutral	3 (6%)	5 (10%)	11 (22%)	8 (16%)	2 (4%)	15 (30%)	6 (12%)	
	D- disagree	2 (22.2%)	0 (0%)	5 (55.6%)	0 (0%)	0 (0%)	2 (22.2%)	0 (0%)	
	A-strongly agree	7 (8%)	6 (6.9%)	25 (28.7%)	16 (18.4%)	5 (5.7%)	15 (17.2%)	13 (14.9%)	
	B-agree	17 (16%)	3 (2.8%)	23 (21.7%)	17 (16%)	2 (1.9%)	23 (21.7%)	21 (19.8%)	
Will be recognized by the patient	C-neutral	11 (11.5%)	8 (8.3%)	29 (30.2%)	8 (8.3%)	4 (4.2%)	28 (29.2%)	8 (8.3%)	0.002
	D- disagree	7 (11.1%)	3 (4.8%)	27 (42.9%)	2 (3.2%)	2 (3.2%)	18 (28.6%)	4 (6.3%)	
	E- strongly disagree	2 (8%)	1 (4%)	16 (64%)	1 (4%)	1 (4%)	4 (16%)	0 (0%)	
	A-strongly agree	19 (14%)	8 (5.9%)	40 (29.4%)	16 (11.8%)	7 (5.1%)	31 (22.8%)	15 (11%)	
	B-agree	18 (12.3%)	8 (5.5%)	49 (33.6%)	15 (10.3%)	2 (1.4%)	37 (25.3%)	17 (11.6%)	
Has double competence in anesthesia and intensive care	C-neutral	4 (5%)	4 (5%)	30 (37.5%)	11 (13.8%)	4 (5%)	15 (18.8%)	12 (15%)	0.557
	D- disagree	2 (14.3%)	1 (7.1%)	1 (7.1%)	2 (14.3%)	1 (7.1%)	5 (35.7%)	2 (14.3%)	
	E- strongly disagree	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	
	A-strongly agree	18 (18.8%)	2 (2.1%)	27 (28.1%)	14 (14.6%)	5 (5.2%)	20 (20.8%)	10 (10.4%)	
	B-agree	18 (16.5%)	8 (7.3%)	25 (22.9%)	15 (13.8%)	3 (2.8%)	24 (22%)	16 (14.7%)	
Can manage all types of emergencies.	C-neutral	7 (5.9%)	7 (5.9%)	41 (34.7%)	12 (10.2%)	6 (5.1%)	29 (24.6%)	16 (13.6%)	0.042
	D- disagree	1 (2.1%)	3 (6.3%)	24 (50%)	3 (6.3%)	0 (0%)	13 (27.1%)	4 (8.3%)	
	E- strongly disagree	0 (0%)	1 (16.7%)	3 (50%)	0 (0%)	0 (0%)	2 (33.3%)	0 (0%)	
	A-strongly agree	22 (15.9%)	5 (3.6%)	51 (37%)	16 (11.6%)	5 (3.6%)	27 (19.6%)	12 (8.7%)	
	B-agree	14 (9.7%)	12 (8.3%)	40 (27.8%)	13 (9%)	6 (4.2%)	34 (23.6%)	25 (17.4%)	
Has a significant workload :	C-neutral	6 (7.6%)	4 (5.1%)	25 (31.6%)	12 (15.2%)	3 (3.8%)	23 (29.1%)	6 (7.6%)	0.395
	D- disagree	1 (7.7%)	0 (0%)	4 (30.8%)	2 (15.4%)	0 (0%)	3 (23.1%)	3 (23.1%)	
	E- strongly disagree	1 (33.3%)	0 (0%)	0 (0%)	1 (33.3%)	0 (0%)	1 (33.3%)	0 (0%)	
	A-strongly agree	14 (12%)	5 (4.3%)	46 (39.3%)	14 (12%)	4 (3.4%)	26 (22.2%)	8 (6.8%)	
	B-agree	17 (10.2%)	12 (7.2%)	48 (28.7%)	18 (10.8%)	5 (3%)	38 (22.8%)	29 (17.4%)	
Can be confronted with potential conflict relationship with the surgeon	C-neutral	10 (12.2%)	4 (4.9%)	24 (29.3%)	12 (14.6%)	4 (4.9%)	22 (26.8%)	6 (7.3%)	0.311
	D- disagree	3 (30%)	0 (0%)	2 (20%)	0 (0%)	1 (10%)	1 (10%)	3 (30%)	
	E- strongly disagree	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	
	A-strongly agree	28 (17.3%)	13 (8%)	53 (32.7%)	14 (8.6%)	4 (2.5%)	35 (21.6%)	15 (9.3%)	
	B-agree	11 (8.2%)	4 (3%)	38 (28.4%)	19 (14.2%)	6 (4.5%)	33 (24.6%)	23 (17.2%)	
Exposed to stress generating situation	C-neutral	4 (6.2%)	4 (6.2%)	23 (35.4%)	8 (12.3%)	3 (4.6%)	16 (24.6%)	7 (10.8%)	0.381
	D- disagree	1 (6.7%)	0 (0%)	6 (40%)	3 (20%)	1 (6.7%)	3 (20%)	1 (6.7%)	
	E- strongly disagree	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	
Expose to the risk of burnout	A-strongly agree	27 (18.1%)	11 (7.4%)	48 (32.2%)	12 (8.1%)	5 (3.4%)	31 (20.8%)	15 (10.1%)	0.376

B-agree	11 (8.7%)	4 (3.1%)	39 (30.7%)	17 (13.4%)	6 (4.7%)	33 (26%)	17 (13.4%)
C-neutral	5 (6.2%)	6 (7.4%)	25 (30.9%)	12 (14.8%)	3 (3.7%)	19 (23.5%)	11 (13.6%)
D- disagree	1 (5%)	0 (0%)	8 (40%)	3 (15%)	0 (0%)	5 (25%)	3 (15%)

(Table 6) displays the job titles of the participants associated with their level of awareness regarding the workplace. The results show that the percentage of participants who strongly agreed and agreed to "Take a central position in the operating room" was highest among the intern group (30.1% and 28.7%, respectively), while the Pharmacist group had the lowest percentage (4.8% and 2.5%, respectively). However, there was no significant difference between the groups regarding this awareness item (P=0.667). Similarly, the

awareness item "Has double competence in anesthesia and intensive care" showed no significant difference (P=0.655) between the groups. Regarding the awareness item "Can manage all types of emergencies," the highest percentage of participants who strongly agreed and agreed were observed among the intern group (30.5% and 28.9%, respectively), while the pharmacist group had the lowest percentage (5% and 2.3%, respectively). However, there was no significant difference.

**Table 6.** Job title of participants in association with awareness items regarding workplace (n=377)

Parameter	Position							P-value	
	Consultant	GP	Intern	Nurse	Pharmacist	Resident	Specialist		
Take a central position in the operating room	A-strongly agree	22 (15.1%)	9 (6.2%)	44 (30.1%)	17 (11.6%)	7 (4.8%)	31 (21.2%)	16 (11%)	0.667
	B-agree	14 (11.5%)	4 (3.3%)	35 (28.7%)	15 (12.3%)	3 (2.5%)	32 (26.2%)	19 (15.6%)	
	C-neutral	5 (6.1%)	8 (9.8%)	28 (34.1%)	11 (13.4%)	3 (3.7%)	17 (20.7%)	10 (12.2%)	
	D- disagree	3 (13%)	0 (0%)	11 (47.8%)	1 (4.3%)	1 (4.3%)	6 (26.1%)	1 (4.3%)	
Has double competence in anesthesia and intensive care.	E- strongly disagree	0 (0%)	0 (0%)	2 (50%)	0 (0%)	0 (0%)	2 (50%)	0 (0%)	0.655
	A-strongly agree	22 (15.3%)	9 (6.3%)	46 (31.9%)	16 (11.1%)	7 (4.9%)	30 (20.8%)	14 (9.7%)	
	B-agree	12 (10%)	4 (3.3%)	34 (28.3%)	16 (13.3%)	3 (2.5%)	31 (25.8%)	20 (16.7%)	
	C-neutral	5 (6%)	8 (9.6%)	29 (34.9%)	11 (13.3%)	3 (3.6%)	17 (20.5%)	10 (12%)	
Can manage all types of emergencies	D- disagree	4 (16%)	0 (0%)	9 (36%)	1 (4%)	1 (4%)	8 (32%)	2 (8%)	0.744
	E- strongly disagree	1 (20%)	0 (0%)	2 (40%)	0 (0%)	0 (0%)	2 (40%)	0 (0%)	
	A-strongly agree	20 (14.2%)	9 (6.4%)	43 (30.5%)	17 (12.1%)	7 (5%)	29 (20.6%)	16 (11.3%)	
	B-agree	15 (11.7%)	4 (3.1%)	37 (28.9%)	15 (11.7%)	3 (2.3%)	34 (26.6%)	20 (15.6%)	
	C-neutral	6 (7.3%)	8 (9.8%)	28 (34.1%)	11 (13.4%)	3 (3.7%)	17 (20.7%)	9 (11%)	
	D- disagree	3 (13.6%)	0 (0%)	10 (45.5%)	1 (4.5%)	1 (4.5%)	6 (27.3%)	1 (4.5%)	
	E- strongly disagree	0 (0%)	0 (0%)	2 (50%)	0 (0%)	0 (0%)	2 (50%)	0 (0%)	

Anesthesia is an essential component of modern surgical procedures, and its importance in patient care cannot be overstated [9]. Anesthesiologists play a critical role in ensuring the safety and comfort of patients before, during, and after surgery [10]. Their responsibilities include assessing and optimizing patients' medical status before surgery, administering and monitoring anesthesia during the procedure, and managing pain and other complications after surgery. Despite the importance of anesthesiologists in patient care, the role they play is often misunderstood or underappreciated by healthcare workers [11, 12].

Awareness about the role of anesthesiologists among healthcare workers who are not part of this specialty is an essential aspect of patient safety in Saudi Arabia. The study aimed to evaluate the level of knowledge about the role of

anesthesiologists among healthcare workers in the Eastern Province of Saudi Arabia. The study's results presented in (Tables 2-6) showed that the majority of the participants had a good level of awareness about the role of anesthesiologists in anesthesia management. However, some participants did not know who was responsible for specific tasks, such as managing immediate postoperative complications or covering the pain clinic for chronic pain patients. The results also showed that job titles significantly influenced the participants' responses to knowledge items. The study found no significant difference in the level of agreement among service providers, including interns, specialists, pharmacists, residents, nurses, and consultants, regarding the awareness items.

The study's results showed that participants correctly identified anesthesiologists as the responsible party for various aspects of anesthesia management. For example, administering anesthesia, determining patient fitness, deciding on the type of anesthesia, and inserting an epidural catheter for pain management during labor. However, some participants identified other healthcare professionals, such as surgeons, nurses, or anesthesia technologists, as responsible for these tasks. Such a lack of knowledge could lead to critical errors in patient care, especially in emergencies. Therefore, healthcare institutions must prioritize education and training programs to increase awareness of the roles and responsibilities of anesthesiologists among healthcare workers.

The study also found that the majority of participants strongly agreed or agreed that anesthesiologists are service providers, members of the resuscitation team in the hospital, have an activity with a high degree of responsibility, have important decision power for patient management in the operation room, and can manage all types of emergencies. However, only a minority of participants strongly agreed or agreed that anesthesiologists are recognized by patients and have double competence in anesthesia and intensive care. This finding suggests that there is a need to raise public awareness about the role of anesthesiologists, as patients' perception of anesthesiologists' role in their care could influence their overall satisfaction with the healthcare service they receive.

This finding indicates that there is a need to provide more education and training to healthcare workers to increase their knowledge of the roles and responsibilities of anesthesiologists in patient care.

## CONCLUSION

In conclusion, the study revealed that most healthcare workers in the Eastern Province of Saudi Arabia had a good level of awareness about the role of anesthesiologists in anesthesia management. However, some participants lacked knowledge about specific tasks, such as managing immediate postoperative complications or covering the pain clinic for chronic pain patients. The study found that job titles significantly influenced the participants' responses to knowledge items, indicating a need to provide more education and training to increase their knowledge of the roles and responsibilities of anesthesiologists. The study's findings highlight the importance of increasing awareness about the role of anesthesiologists among healthcare workers and the public to improve patient safety and satisfaction. Healthcare institutions should prioritize educational programs and training sessions for healthcare workers to increase their knowledge and awareness of anesthesiologists' roles and responsibilities in patient care.

## Application

Despite their significant services in continuity of care, anesthesiologists' role has never been appreciated by the

media, patients, or even health care workers. Acknowledgment of their role by healthcare workers would help in positioning this crucial field of medicine and giving them the privilege they deserve, which in the end will affect the comprehensive care of patients.

## Limitations

A strong aspect of the present study is that it is one of the first studies to be conducted in Saudi Arabia to assess awareness about the role of anesthesiologists among healthcare workers rather than patients, as most studies published before, and not only but also it is based on a multi-institutional level.

However, the present study is not without limitations. Our study included a limited sample size and was conducted only in the Eastern Province of Saudi Arabia. Thus, the results of it cannot be generalized to the entire population of healthcare workers. Moreover, this study used an anonymous questionnaire that is mainly based on closed questions which may contribute to a loss of information compared to what could be acquired if open questions or interviews were used to collect the data.

## Recommendations

For future research: A nationwide study involving the entire community of healthcare workers of Saudi Arabia is recommended for a broader picture of the level of awareness of healthcare workers about the role of anesthesiologists. Such a study should be with a larger sample size. Similar studies should also be conducted not just in Saudi Arabia, but rather in the rest of the Middle East as well.

For Healthcare workers: Increasing awareness about the role of anesthesiologists among healthcare workers is important to improve patient safety and satisfaction. Thus, it is recommended to provide more education and training to increase the knowledge of healthcare workers about the roles and responsibilities of anesthesiologists.

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