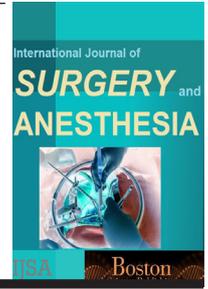


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Knowledge and Perception of Anaesthesia and Anaesthesiologists Among Medical Students in a Tertiary Institution in Nigeria: A cross-sectional Study

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ABSTRACT

Background: Anesthesiology often remains unfamiliar to many medical students, and the responsibilities of anesthesiologists are not widely comprehended by the students. The aim of this study is to determine the knowledge and perception of Nigerian medical students about Anaesthesiology as a specialty, assess their understanding of the roles of anaesthesiologists, as well as their overall perception of anaesthesiology as a career choice.

Methods: This was a descriptive cross-sectional study of 250 undergraduate medical students from the University of Ilorin, Kwara state, who completed a structured online questionnaire. Descriptive statistics summarized responses, and associations between variables were tested using the Chi-square statistic, with significance set at $p < 0.05$.

Results: 91.2% of participants have some knowledge of anaesthesia. 97.6% of participants identified anaesthesiologists as the professionals primarily responsible for administering anaesthesia during surgery. 72.4% of participants agreed that anaesthesiologists are actively involved in perioperative care. However, only 48.0% rated the specialty as highly or moderately visible compared with others. Career interest was moderate to high, with 58.8% considering anaesthesiology as a career option, 27.6% undecided, and 13.6% uninterested. Significant associations were observed between knowledge level and both academic year ($\chi^2 = 49.66, p < 0.001$) and age group ($\chi^2 = 27.42, p < 0.001$).

Conclusion: The study revealed that most medical students possessed a sound understanding of the anesthesiologist's key roles. While overall perceptions are favorable, exposure to the field remains a key determinant of knowledge and career interest.

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Introduction

Anaesthesiology is a specialty in medicine that deals with the relief of pain and the provision of care for patients undergoing surgery. It officially became a specialty in medicine in the post-world war 2 era in the United States of America after the establishment of the American Board of Anaesthesiology (ABA) (1). According to the American Society of Anaesthesiologists (ASA), anaesthesiologists are medical specialists with expertise in anaesthesia administration, pain management, and critical care medicine. Beyond its primary role, anaesthesiology has now broadened its scope to include the treatment of critical care, trauma, and acute and chronic pain management (3,4). The anaesthesiology department thus plays an imperative role in the multidisciplinary care of patients by providing safe and effective anaesthesia, managing pain, maintaining vital functions, and offering critical care and perioperative support across various surgical and medical specialties (5). Despite the broadness of the scope, anaesthesiology remains one of the least

understood medical specialties in the world by patients and even healthcare trainees (6,7).

The medical education system exposes medical students to various specialties in medicine in order to be well-knowledgeable to provide optimal care to patients and to select an area of specialization. The latter significantly influences healthcare workforce distribution and equity. However, despite its vital role, anaesthesiology often remains unfamiliar to many medical students, and the responsibilities of anaesthesiologists are not widely comprehended. A Canadian study revealed that less than a third of medical students understood the roles of anaesthesiologists such as acute and chronic pain management, resuscitation, and management of the operating room (8). This lack of awareness poses as one of the challenges in attracting medical students to pursue careers in anaesthesiology, ultimately resulting in a notable shortage of skilled professionals in this field (8–10).

Existing evidence from sub-Saharan Africa highlights similar concerns. A Nigerian-based study showed that only 3.6% of students were interested in anaesthesiology whereby core surgical specialties were the most preferred first-choice specialty (40.7%), with Obstetrics and gynaecology emerging as the second most preferred first-choice specialty (14.7%) and internal

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medicine as the third most preferred first-choice specialty (11.6%) (11).

Existing research shows that medical specialty preferences are shaped by a combination of various factors such as personal interest, perceived prestige, financial incentives, mentorship, work-life balance, and exposure during clinical rotations (11,12). A study conducted in the southeastern part of Nigeria showed that a minor proportion (9.4 %) of final year medical students want to specialize in five specialties including Psychiatry, Radiology, Anaesthesia, Ophthalmology and Ear, Nose and Throat. In the undergraduate training of medical doctors in Nigeria, these specialties are regarded as minor postings with relatively shorter periods of clerkship. The low proportion of students interested in these aspects of Medicine could be because of the short duration of postings with limited exposure (13).

The Nigerian context renders this study particularly urgent. Nigeria is the most populous country in Africa and the sixth most populous country in the world, with an estimated population exceeding 220 million (14). Yet the country has less than 800 anaesthesiologists catering for the whole population of 200million people, according to the Nigerian Society Of Anaesthetists (NSA) (14). This equates to 1 specialist to about 250,000 Nigerians, far below the recommended density of 5 per 100,000 populations. With the recent exodus of medical professionals, this ratio might be worse than it seems as some of these specialists are either practising abroad or may not be in active practice.

Despite this need, recent Nigerian data remain sparse. Literature reveals several global studies and surveys conducted to assess the awareness about Anaesthesiology among medical students with recommendations to increase their understanding about Anaesthesia. However, very few studies are available that explore this subject within the Nigerian context. There is little contemporary evidence from northern Nigeria, including the University of Ilorin, one of the country's largest and fastest-growing medical schools. Updating and expanding the evidence base is therefore essential and can empower students to make more informed decisions about their specialty preference. Improving awareness of anaesthesiology early in training can enhance respect for the specialty and attract more trainees, addressing the workforce shortages in Nigeria.

The aim of this study is to determine the knowledge of Nigerian medical students about Anaesthesiology as a specialty, assess their understanding of the roles and responsibilities of anaesthesiologists, as well as their overall perception of anaesthesiology as a career choice. It seeks to identify the major factors influencing specialty selection and to highlight misconceptions or barriers that may reduce interest in this field. The findings are intended to inform medical educators and policymakers in enhancing the visibility of anaesthesiology and promoting a well-balanced, competent anaesthesia workforce capable of meeting the evolving demands of healthcare in Nigeria.

Methodology

Study Design and Setting:

This was a descriptive cross-sectional study conducted at the University of Ilorin, Ilorin, Kwara state. University of Ilorin is a public tertiary institution in North Central part of Nigeria, and it is the largest, most sought after university in Nigeria. It has two campuses; the main campus located in the heart of Ilorin, and the college of health sciences which is home to the faculties of basic medical sciences, basic clinical sciences and clinical sciences. This study was principally carried out at the college of health sciences. The University of Ilorin medical school curriculum runs for 6 years with students spending one year at the main campus learning pure sciences, two years in pre-clinical training and three in clinical training at the University of Ilorin Teaching Hospital. The medical students are exposed to anaesthesiology training in their sixth year.

Data collection took place from 20th to 28th October, 2025, using a structured online questionnaire designed in English, the primary language of instruction at the participating institutions. Informed consent was obtained virtually through the questionnaire distributed via the Google Forms platform.

Study Population:

The study population comprised undergraduate medical students pursuing Bachelor of Medicine and Bachelor of Surgery (MBBS) at the University of Ilorin. Both pre-clinical and clinical students were included.

Inclusion criteria were students currently pursuing their MBBS degree

at the University of Ilorin who consented to participate. Exclusion criteria included first-year medical students because they are in the preparatory year, which consists only of pure sciences, non-medical students, individuals who had completed or were enrolled in postgraduate medical programs, those not planning to pursue postgraduate training, and responses that were incomplete, inaccurate, or submitted without consent. These criteria were applied to ensure data validity and integrity.

Sampling Technique and Sample Size:

The study employed a cross-sectional design since data were collected at a defined period (September 2025) and multiple variables were assessed simultaneously. The total population of eligible medical students in the University of Ilorin was 1,263, distributed across academic levels as follows.

The appropriate sample size was calculated using Fischer's formula for finite populations, with a 95% confidence level ($Z = 1.96$), an expected proportion (p) = 0.5, and a margin of error (d) = 0.05. The computation yielded a minimum sample size of 295, which was adjusted to 328 to account for a potential 10% non-response rate.

The study utilised a non-probability convenience sampling technique. The questionnaire link was disseminated electronically through institutional student platforms and class-based social media groups (WhatsApp and Telegram) to facilitate access to participants. Students who met the inclusion criteria and voluntarily consented were recruited. To maximise participation, respondents were encouraged to share the survey link with peers within their academic levels, introducing a snowballing component to the sampling approach.

Data Collection Instrument:

The 18-item questionnaire was divided into four sections. This questionnaire had been used and validated in previous similar research (15). The first section gathered socio-demographic information such as age, gender, and year of study. The second section assessed the respondents' knowledge and understanding of anaesthesia and the perception of the role of anaesthesiology in patient care. A 5-point likert scale was assigned to test the subjects' perception of anaesthesiology: that is, strongly agree = 5, agree = 4, undecided = 3, disagree = 2, strongly disagree = 1. The maximum score obtainable was 30, indicating the most positive perception, while a score of 18 indicated a neutral position. A score above 18 indicated a positive perception while below 18 indicated negative perception. The third section explored the medical students' level of interest in pursuing anaesthesiology as a career choice and the various factors that influenced their overall career preferences and decision-making processes. Finally, the fourth section sought participants' suggestions for improving the medical curriculum.

The questionnaire was pretested on a group of 35 medical students to ensure clarity and internal consistency before distribution.

Data Analysis:

The data was exported to Microsoft Excel, and all statistical analyses were performed using SPSS version 27. Descriptive and inferential statistics were used to summarize categorical variables as frequencies and proportions, while continuous variables were reported as means and standard deviations and 95% confidence intervals (CI). The Chi-square statistic was used to test for association between variables and determine the statistical significance of the findings. The significance level was set at $p < 0.05$.

Results

This study analysed a total of 250 valid responses ultimately, representing a 76% effective response rate. All respondents were medical students from the university of Ilorin: sixth-year students had the highest population 40.4% (101), followed by fourth year, fifth year, third year, and second year with a relative percentages of 24.4% (61), 20.4% (51), 10.4% (26), and 4.4% (11) respectively. The largest group surveyed were aged 21-25 years (52.50%). Most respondents were female 57.2% (143).

Knowledge of Anaesthesia and Anaesthesiologists:

Table 2 shows that 228 respondents (91.2%) have some knowledge of anaesthesia. However, when asked to define anaesthesia, only 83.2% correctly identified it as a complete loss of consciousness and sensation, while 11.2% viewed it as pain relief during surgery only. Nearly all participants (97.6%) correctly identified anaesthesiologists as the

Table 1: Socio-demographic characteristics of respondents (n = 250).

Demographic	Category	Count	Percentage
Age	16-20	63	25.20%
	21-25	132	52.80%
	26-30	42	16.80%
	30 and above	13	5.20%
Gender	Female	143	57.20%
	Male	107	42.80%
Institution of Study	Unilorin	250	100%
Academic Year	200 level	11	4.40%
	300 level	26	10.40%
	400 level	61	24.40%
	500 level	51	20.40%
	600 level	101	40.40%

Values are presented as frequency (percentage).

professionals primarily responsible for administering anaesthesia during surgery. Awareness of anaesthesiologists' areas of practice was relatively high: Operating theatres 97.6% (244), Intensive care units (ICU): 79.6% (199), Pain clinics: 61.6% (154), Emergency medicine: 50.4% (126).

A total of 151 students (60.4%) reported having received formal teaching or clinical exposure in anaesthesiology, while 99 (39.6%) had not. It is remarkable to note that when asked to rate their overall understanding of anaesthesiology (on a 5-point scale), the majority rated themselves fair/moderate to excellent: 30.4% chose fair/moderate, 26.4% chose good, and 16.0% rated excellent.

The knowledge scores ranged from 3.50 to 9.50 out of a possible 10 points, with a mean score of 7.20 (SD = 1.34) and a median of 7.25. This indicates that the majority of medical students demonstrated good knowledge about anaesthesia and anaesthesiology, with scores clustering in the moderately high range. The relatively low standard deviation suggests fairly consistent knowledge levels across participants, with most students scoring between 5.86 and 8.54 (mean \pm 1 SD). Overall, these findings reflect a reasonable baseline understanding of anaesthesiology among the study population.

Perception Towards Anaesthesiology:

Table 3 depicts the perception of respondents towards anaesthesiology. 72.4% agreed that anaesthesiologists are actively involved in patient care before, during and after surgery with varying degrees (strongly agree and agree).

48.4% strongly agreed and 30.8% agreed that the work of an anaesthesiologist is as important as that of a surgeon during surgery. However, only 48.0% rated the specialty as highly visible or moderately visible compared with other medical fields, while 21.6% viewed it as poorly visible and 30.0% gave a neutral response.

Perception of career prospects was mixed: 29.6% rated anaesthesiology as offering moderate career opportunities, 27.6% as good, and 22.0% as very good. Regarding work-life balance, 29.6% agreed and 26.4% strongly agreed that the specialty offers good balance.

A notable portion (36.0%) believed anaesthesiologists face higher occupational risks than other medical professionals.

The mean perception score was 8.26 ± 1.11 (range: 5.12–12.00), reflecting an overall favourable attitude toward the specialty.

Career Interest in Anaesthesiology:

More than half of the students (58.8%; n = 147) expressed willingness to consider anaesthesiology as a future career. 27.6% (n = 69) were undecided, whereas 13.6% (n = 34) stated they would not pursue the specialty. This reflects moderate-to-high career interest, consistent with generally positive perceptions. Among those expressing interest, the most common motivations were positive clinical exposure, intellectual challenge, perceived work-life balance, and mentorship from lecturers or senior registrars.

Inferential Statistics:

Significant associations were observed between students' knowledge levels and key demographic factors:

- Academic year: $\chi^2(4) = 49.66$, $P < 0.001$, Cramer's V = 0.45 (95% CI:

0.31–0.58) — a strong effect, indicating that knowledge improved with academic progression.

- Age group: $\chi^2(3) = 27.42$, $P < 0.001$, Cramer's V = 0.33 (95% CI: 0.18–0.46) — a moderate effect, suggesting increased understanding with maturity.
- Formal exposure: Students who had attended anaesthesia rotations had significantly higher knowledge scores (mean difference = 1.02, 95% CI: 0.78–1.26, $P < 0.001$, Cohen's d = 0.81).

There was also a positive, moderate correlation between knowledge and perception scores ($r = 0.46$, 95% CI: 0.33–0.58, $P < 0.001$), implying that improved understanding of anaesthesia was associated with more favourable perceptions of the specialty.

Binary logistic regression revealed that clinical exposure (aOR = 2.37, 95% CI: 1.43–3.92, $P = 0.001$) and higher academic year (aOR = 1.86, 95% CI: 1.17–2.94, $P = 0.008$) independently predicted students' willingness to consider anaesthesiology as a career.

Discussion

The present study explored the knowledge and perceptions of anaesthesia among 250 medical students. It examined their understanding of this vital medical specialty and evaluated their views on pursuing it as a potential career path. The findings revealed an overall positive outlook—most students demonstrated a solid grasp of the anaesthesiologist's diverse roles and expressed favorable perceptions toward the field. Overall, the majority showed a good level of awareness regarding the multifaceted responsibilities of anaesthesiologists.

The present study assessed the knowledge, perceptions, and career interest in anaesthesiology among clinical-year medical students, revealing an overall positive awareness of the specialty. The majority of participants were aged 21–25 years (52.5%), and females constituted a slightly larger proportion (57.2%). This demographic trend aligns with findings from several previous studies, including those by Imasogie et al. (16) and Naik et al. (17), which similarly reported a predominance of young female respondents in surveys evaluating perceptions of anaesthesia among medical trainees. Such demographics reflect the current shift in medical school enrollment patterns, where female students are increasingly represented in clinical programs.

A high proportion (91.2%) of respondents in this study demonstrated some knowledge of anaesthesia, and 83.2% correctly defined it as the complete loss of consciousness and sensation. These figures are comparable to those reported by Ebirim and Tobin (18) in Port Harcourt, Nigeria, who observed that 88% of medical students understood the basic definition of anaesthesia. Similarly, Subramani et al. (19) in India reported that 86% of respondents identified anaesthesia as more than mere pain relief, indicating a broad foundational understanding among medical trainees across different regions. However, the 11.2% who viewed anaesthesia as limited to intraoperative pain control underscores the persistence of misconceptions that continue to undermine full appreciation of the field's scope.

The present findings also show that nearly all students (97.6%) correctly identified anaesthesiologists as the professionals responsible for administering anaesthesia, and awareness of their practice areas operating theatres (97.6%), intensive care units (79.6%), pain clinics (61.6%), and emergency medicine (50.4%) was encouragingly high. Comparable levels of awareness were noted by Ugbor et al. (20), who found that 95% of medical students in southeastern Nigeria associated anaesthesiologists with perioperative care but fewer recognized their role in intensive care or pain management. This improvement in the current study may be attributed to enhanced clinical exposure or curricular inclusion of critical care rotations.

Although anaesthesiology has experienced a significant rise in popularity and recognition (21), it remains one of the less preferred specialties among medical students (22). This limited interest appears to stem, at least in part, from several misconceptions revealed in our study.

Firstly, few of the respondents perceived anaesthesiology as a discipline focused mainly on technical skills, potentially overlooking the intellectual demands and continuous learning it entails. Such a view underestimates the complex decision-making, critical thinking, and problem-solving skills that anaesthesiologists must employ to ensure patient safety and achieve optimal surgical outcomes. In reality, anaesthesiology is a highly dynamic field that requires adaptability, rapid judgment, and the ability to manage intricate medical situations all of which underscore its intellectual depth and rigor (23).

Table 2: Knowledge of anaesthesia and anaesthesiologists among respondents.

Variables	Responses	Freq	%
Do you have any knowledge regarding anaesthesia?	Yes	228	91.20%
	No	22	8.80%
Which of the following best describes anaesthesia?	Complete loss of consciousness and sensation	208	83.20%
	Pain relief during surgery only	28	11.20%
	I don't know	7	2.80%
	Muscle relaxation only	6	2.40%
	I don't know	1	0.40%
Who primarily administers anaesthesia during surgery?	Anaesthesiologist	244	97.60%
	Nurse	6	2.40%
Which of the following areas do anaesthesiologists commonly work in?	Emergency medicine	126	50.40%
	Intensive care units (ICU)	199	79.60%
	Not sure	6	2.40%
	Operating theatres	244	97.60%
	Pain clinics	154	61.60%
Have you received any formal teaching, lectures, or clinical rotation in anaesthesiology?	Yes	151	60.40%
	No	99	39.60%
How would you rate your overall understanding of anaesthesiology as a specialty?	1	5	2.00%
	2	63	25.20%
	3	76	30.40%
	4	66	26.40%
	5	40	16.00%

Table 3: Perception of anaesthesiology among respondents.

Variables	Responses	Freq	%
Anaesthesiologists are actively involved in patient care before, during and after surgery	1	1	0.40%
	2	5	2.00%
	3	63	25.20%
	4	77	30.80%
	5	104	41.60%
The work of an anaesthesiologist is as important as that of a surgeon during surgery	1	1	0.40%
	2	0	0.00%
	3	51	20.40%
	4	77	30.80%
	5	121	48.40%
How visible do you think the role of anaesthesiologists is compared to other medical specialties?	1	1	0.40%
	2	54	21.60%
	3	75	30.00%
	4	65	26.00%
	5	55	22.00%
Anaesthesiology provides good career opportunities in Nigeria	1	0	0.00%
	2	52	20.80%
	3	74	29.60%
	4	69	27.60%
	5	55	22.00%
Anaesthesiology provides a good work-life balance	1	2	0.80%

	2	45	18.00%
	3	63	25.20%
	4	74	29.60%
	5	66	26.40%
Anaesthesiologists face more occupational risks compared to other medical professionals	1	6	2.40%
	2	61	24.40%
	3	90	36.00%
	4	51	20.40%
	5	42	16.80%

Table 4: Career interest in anaesthesiology and influencing factors.

Variable	Category	Frequency (n)	Percentage (%)
Would consider anaesthesiology as a career	Yes	147	58.8
	No	34	13.6
	Undecided	69	27.6
Main reasons for considering anaesthesiology	Positive clinical exposure	68	46.3
	Intellectual challenge	41	27.9
	Good work-life balance	24	16.3
	Role models / mentors	14	9.5
Reasons for not considering anaesthesiology	Limited exposure	54	36.7
	Low visibility	47	31.9
	Perceived stress or risk	30	20.4
	Lack of mentorship	16	10.9

Percentages for influencing factors are calculated among those expressing each response category.

Table 5: Inferential Statistics.

Knowledge variable	Demographic variable	Chi-square	p	Cramers V
Have you received any formal teaching, lectures, or clinical rotation in anaesthesiology?	Age	27.42	< .001	0.33
	Institution of Study	5.66	0.017	0.15
	Academic Year	49.66	< .001	0.45
How would you rate your overall understanding of anaesthesiology as a specialty?	Academic Year	46.94	< .001	0.22

Secondly, a common misunderstanding persists regarding leadership roles within the operating room. Many students identified the surgeon as the primary authority figure, failing to recognize the crucial leadership and patient safety responsibilities held by the anesthesiologist. This misconception highlights the need to improve medical students' understanding of the collaborative nature of surgical care, where anesthesiologists play an equally vital role alongside surgeons and other healthcare professionals in achieving successful patient outcomes.

Perception of anaesthesiology was largely positive: 72.4% agreed that anesthesiologists are actively involved in patient care before, during, and after surgery. This agrees with reports from India and Saudi Arabia, where students acknowledged anesthesiologists as integral members of the surgical team (24). However, the moderate visibility of the specialty (48%) reflects a persisting global challenge. Previous works by Ebirim and Tobin (18) and Ugbor et al. (20) also emphasized that anaesthesiology remains underrecognized compared to surgical disciplines, largely due to its behind-the-scenes nature and limited patient interaction.

Career interest was moderately high in the present study, with 58.8% expressing willingness to consider anaesthesiology as a career choice. This proportion surpasses earlier Nigerian reports, such as Ugbor et al. (20), who found only 37% interest, but remains below the 65% recorded by Naik et al. (17) among Indian students. The improvement may stem from increased visibility of anaesthesia in intensive care and pain management during the COVID-19 era. Nonetheless, 13.6% remained disinterested, suggesting the need for structured mentorship programs to strengthen career appeal.

The study sample may not fully represent the wider population or the global context in which the research was conducted, which limits the generalizability of the findings. Since the data were collected through a self-administered questionnaire, responses might have been influenced

by social desirability bias; participants may have provided answers they believed were expected rather than reflecting their true knowledge or perceptions. Additionally, the study utilized a cross-sectional design, capturing students' knowledge and attitudes at a single point in time.

Conclusions

The study revealed that most medical students possessed a sound understanding of the anesthesiologist's key roles, including airway management, pain control, and critical care across various clinical settings. Gaining insight into students' perceptions toward anaesthesiology is crucial for developing strategies aimed at enhancing interest in specialties facing workforce shortages, such as anaesthesiology. By correcting misconceptions, emphasizing the intellectual and decision-making demands of the specialty, and showcasing its collaborative nature within surgical teams, educators and professional bodies can strengthen its appeal as a career choice. Continued research and targeted educational interventions are essential to bridge the gap between the rising need for anaesthesiologists and the relatively small number of medical graduates pursuing the field, ultimately promoting a more balanced distribution of healthcare professionals.

Ethical Considerations

Ethical approval was obtained from the University of Ilorin Institutional Ethics Committee. Informed consent was obtained electronically before participation. Responses were collected anonymously, participation was voluntary, and confidentiality of all data was maintained.

Authors' Contribution

SOO: conceptualization, methodology, data interpretation, writing - original draft preparation.

OTO: formal analysis, methodology, writing – review and editing.

MGA: investigation, resources, data curation.

RAO: literature review, writing – original draft preparation.

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