South Afr J Anaesth Analg. 2024;30(6):169-172
https://doi.org/10.36303/SAJAA.3143

South Afr J Anaesth Analg
ISSN 2220-1181 EISSN 2220-1173

OPINION

Rethinking undergraduate anaesthesia: an African perspective on a missed opportunity to grow specialist anaesthesia training

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With an anaesthesia specialist provider density that falls short of what a functioning health system needs, African countries cannot meet the growing need for safe surgery. Upscaling postgraduate training to meet this shortfall will require more recruits to take up trainee positions. Unfortunately, few undergraduate medical students consider anaesthesiology a future career choice in Africa due to a consistently documented poor perception of the speciality brought on by uninspiring exposure during short clinical rotations. The result is a lopsided preference for surgical specialities that are not appropriately matched with interest in anaesthesia as a career choice. As medical education expands throughout the continent, we explored the connections in the supply of specialist trainee applicants and discussed the challenges faced at each level that reduce the potential growth in the speciality. We proposed measures that could reverse the trend by enhancing undergraduate anaesthesiology rotations to improve the clinical abilities of all medical graduates and increase enrolment in postgraduate training programmes.

Keywords: anaesthesia, medical students, undergraduate education, career choice, Africa

Introduction

Africa's fast-growing population has a correspondingly large need for surgical care, which is largely inaccessible to many and may be unsafe when it is. Safe anaesthesia, a critical part of the surgical service, requires the active participation of a skilled workforce in sufficient numbers to influence positive clinical outcomes effectively.

The Global Anaesthesia Workforce Survey illustrates the challenge faced in Africa in achieving the recommended physician-anaesthesia provider (PAP) density of 5/100 000 population when the average on the continent is just 0.41/100 000 population.[1] While the solutions to this deficit include increasing the number of PAPs, the challenge remains in attracting and recruiting a sufficient number of doctors to participate in postgraduate specialist anaesthesiology training programmes.[2] However, across Africa, it is not unusual to have fewer applicants than the available training positions. The question needs to be addressed: How can we effectively attract enough candidates to anaesthesiology programmes today and in the future?

We have endured the difficulties of recruiting trainees into anaesthesia training programmes in Kenya and have witnessed the same challenges within the East African region. It is imperative to identify the obstacles hindering individuals from choosing this field and take decisive action to overcome them. We need to proactively find solutions to ensure a proficient and competent workforce in anaesthesiology.

This article highlights what we believe to be a neglected part of the medical school curriculum across Africa. Whereas these concerns have been raised before, it is essential to address the challenges and implications in the context of the situation on the continent.[3] We also intend this to be a call to action to use some practical strategies to turn this situation around.

Discussion

Post medical school

In Kenya, postgraduate anaesthesiology trainees are selected from a pool of registered medical officers. Unfortunately, few of them in this country choose anaesthesiology as their primary speciality due to what they perceive as minimal patient interaction, insufficient recognition from colleagues, and dependence on surgeons for work.[4] A survey of medical officers in Nigeria revealed similar results, with only 3.1% expressing interest in specialist anaesthesiology training.[5]

Upon leaving medical school, the negative perception of anaesthesiology appears already established. Only a small percentage of Nigerian interns (1.8%) expressed a primary interest in specialising in anaesthesiology, with the majority opting for the "Big Four" (surgery, obstetrics and gynaecology, internal medicine, and paediatrics).[6] It can be rationalised that these were freshly recruited interns just out of undergraduate training and with preconceived future career choices already decided upon in medical school.[5]

Studies have shown that between 10.3% of final-year students and 11.2% of a cohort comprising third to fifth-year students were undecided about their future speciality and were potentially open to possibilities.[6,7] With additional clinical exposure and mentorship during the internship period, along with experience as medical officers, these doctors may change their minds about their future career choices. However, the question will arise: Has anaesthesiology already missed the boat?

Table I: Review of anaesthesiology as a speciality choice amongst medical students in Africa

Author	Year	Country	Sample size (*n*)	Medical school population	Proportion who would choose anaesthesia (overall)	Ratio of interest in anaesthesia versus surgery-related specialities
Abdul-Rahman et al.[10]	2015	Ghana	146	Final year	1.4%[++]	1:23
Ossai et al.[6]	2016	Nigeria	409	Final year	0.7%[++]	1:59
Dossajee et al.[11]	2016	Kenya	156	Final year	2.5%[+]	4:79
Chan et al.[9]	2016	Rwanda	79	Final year	2.5%[+]	1:16
Gqiba et al.[2]	2017	South Africa	112	Final year	8.0%[+]	1:6

[+] Anaesthesiology as the sole first choice.
[++] Anaesthesiology within a set of choices.

Undergraduate anaesthesiology rotation

The undergraduate clinical anaesthesiology rotation in medical schools is frequently listed as a "special" rotation that is often short and may be entirely voluntary. However, across various African medical colleges, reports indicate a notable diversity in the duration of placements, ranging from a median of 25 (10–35) working days in South Africa to anecdotal evidence suggesting two weeks in Uganda and up to eight weeks in Tanzania.[8] It is also crucial to recognise that the actual duration of anaesthesia rotations may result from systemic factors that prioritise shortening them to compensate for time lost in other areas.

Unsurprisingly, medical students ranked anaesthesia as a speciality career poorly (Table I) because the rotation was too short, and they had inadequate contact with the anaesthesiologists. They also rated the field as frightening or uninteresting, the speciality as poorly understood, and anaesthetists having a subservient role.[2,9,10] These significantly negative perceptions may impact anaesthesia as a career choice if the rotation does not provide adequate opportunity to showcase the scope of anaesthesia practice and dispel misconceptions.

The duration of medical training in specific undergraduate programmes across the continent has increased from five to six years, such as at the University of Nairobi. However, the anaesthesiology rotation has remained relatively short and "untouched". This could send medical students a message about which specialities are deemed more valuable in the profession.

Nonetheless, the undergraduate exposure, as currently set up, still significantly influences the perception of anaesthesiology in South Africa, and the number of medical students who consider the speciality has increased over time.[2,12] Personal communications with heads of anaesthesiology departments in South Africa have also revealed intense competition for training positions and long waiting lists. This stands in stark contrast to much of the African continent, highlighting the importance of evaluating the implementation of this rotation and addressing any shortcomings.

Moreover, increasing the duration of the internship-based anaesthesiology rotation from two weeks to two months also produced a significantly changed attitude toward the speciality, with the reported favourable factors being a good experience during the rotation, appreciation for pharmacology and physiology, excellent working hours, and a good work environment in the operating theatres.[13] These factors mirror some of those identified as having a significant influence on the future speciality choices of medical students. We postulate that increasing the duration of undergraduate anaesthesia rotations could have a similar effect, as 21% of medical students suggested.[2]

Despite the significant growth of undergraduate medical schools in Africa, there appears to be a shortage of applicants for anaesthesia training slots. The reason for this imbalance may become apparent when one considers the significant disparity between the number of medical students who choose anaesthesiology as a specialist career versus those who choose a surgical speciality. This ratio can range from 1:6 to 1:59 (Table I), limiting the pool of potential applicants and challenging the growth of anaesthesiology training programmes.

We believe enhanced clinical exposure should not be limited to the routine induction of general anaesthesia in operating rooms, as is frequently the case. We should aim to encompass preoperative optimisation, regional anaesthesia, critical care, and pain management. Such an approach would challenge the common perception that anaesthesia practice is uninteresting.

The major influence of role models and mentors on medical students implies that their interaction with the anaesthesiology faculty is a critical factor that needs to be comprehensively explored.[6] The expectation is that the faculty will highlight the growing scope of the anaesthesia practice. However, we need to ask whether the "overstretched" anaesthesiologists are prioritising their attention towards postgraduate trainees rather than this "minor" rotation. We postulate that this should be an area of future research.

Bringing about significant changes to a curriculum will require active participation from the anaesthesiology faculty. However, their participation in developing the undergraduate curriculum has largely been superficial and ineffective, likely owing to their emphasis on postgraduate trainees. This represents yet another missed opportunity to influence innovations that may greatly affect the practice of the average African medical officer, many of whom are required to perform clinical tasks in remote locations with little to no supervision.

Paradigm shift

The proliferation of medical schools across the continent and the graduation of thousands of doctors yearly (approximately 1 000 annually in Kenya alone) indicates a clear challenge ahead. However, it also presents an opportunity to expand the anaesthesiologist workforce and raise awareness of its crucial role. This pool of medical graduates can sufficiently support the upscaling of anaesthesia training without impeding the progress of other specialities.

Rwanda provides a compelling illustration of how a methodical and pragmatic approach can yield remarkable results in surmounting obstacles. Since 2015, they have boosted their specialist trainee intake from an annual average of 2–4 to an impressive 9–12.[14]

As a strategy for promoting anaesthesiology as a speciality among medical students in Africa, we propose the following key points:

i. The duration of the undergraduate clinical anaesthesiology rotation should be extended to a minimum of one month. This would allow medical students to understand anaesthesiology comprehensively beyond the conventional perception of only maintaining anaesthesia during surgical procedures. In the short term, the current two-week rotations must be reviewed to make them as comprehensive as possible.
ii. To make the most of the limited time available for the anaesthesiology rotation, it is vital to identify the key topics that will have the greatest impact on a medical officer's ability to provide effective care in a low-resource environment. These topics should also be carefully selected to expose the medical student to the evolving scope of this speciality. The need for a standardised core curriculum has been emphasised.[8]
iii. We must consider that a longitudinal approach to teaching anaesthesia-related topics across several undergraduate years may enable the limited faculty to reach more students at a time, reduce the content needed to be taught during a single clinical rotation, and enable more extended student contact with the anaesthesia faculty. This approach has been reported to increase self-reported proficiency in basic anaesthesia-related skills among medical students in South Africa.[8]
iv. The anaesthesiology faculty can benefit from expanding their teaching beyond their core undergraduate subject. They may achieve this by offering hands-on opportunities to all medical students through simulation courses in various areas, such as airway management, resuscitation, patient handovers, and teamwork.[8,15] This will allow anaesthesiologists to showcase their expertise beyond their usual scope of teaching.
v. It is important to foster a positive change in the anaesthesiology faculty's approach to the undergraduate rotation programme. Shifting from a mere tolerance to a more supportive and encouraging attitude toward undergraduate medical students can help create a more welcoming environment that promotes student growth.
vi. Specialist trainees can enhance their skills and contribute to the education of future doctors by sharing the responsibility of educating undergraduate students during rotations. Recognition of this contribution should incentivise this behaviour.
vii. Pairing medical students who select anaesthesia for their elective period with specifically named faculty members in the operating room, intensive care unit, or pain management clinic may provide a more focused experience.
viii. Frequently track the perception of anaesthesiology as a specialist career among medical students, interns, and medical officers. This will allow evaluation of the response to the measures applied to improve the anaesthesiology rotation experience.
ix. African societies of anaesthesiologists should advocate to national medical councils and regulators for university education. Policymakers must be made aware of the value of a comprehensive anaesthesia rotation to medical students and how it can help address the shortage of anaesthesiologists in Africa.

Conclusion

The way medical students perceive their future career options could significantly influence the growth of anaesthesiology as a speciality. Therefore, we urge the PAPs in Africa to act and not miss opportunities to inspire potential trainees to consider anaesthesiology during their undergraduate rotations. We cannot expand PAP training to include the most promising candidates unless we creatively and enthusiastically address the foundational issue of how the speciality is perceived.

Suppose medical officers decide to pursue another speciality in their career. In that case, the skills and knowledge gained from an immersive anaesthesiology rotation will help them develop competencies in areas that anaesthesiologists excel at teaching. This experience will better prepare them for whatever their practice may be.

Conflict of interest

The authors declare no conflict of interest.

Funding source

No funds, grants, or other support was received.

Ethical approval

Ethical approval is not applicable as this work is a perspective based on published work. The authors declare that this submission is in accordance with the principles laid down by the Responsible Research Publication Position Statements, as developed at the Second World Conference on Research Integrity in Singapore, 2010.

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