ORIGINAL RESEARCH

Factors affecting satisfaction with training programmes and the choice of anaesthesiology as a career among trainee physicians in Ethiopia: A cross-sectional study

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Abstract

Background
The number of physicians applying for anaesthesiology residency training in Ethiopia has increased in recent years but remains inadequate to meet the country's rising demands. We identified factors influencing career choices among physician anaesthesiology trainees in Ethiopia and described the challenges physicians face during training.

Methods
Semistructured, self-administered questionnaires were distributed to all anaesthesiology residents in 2017 in Ethiopia. The questionnaire addressed demographic factors, exposure to the field of anaesthesiology during undergraduate training, reasons for the choice of anaesthesiology as a specialty, the teaching and working environment, and future career plans.

Results
In total, 45 anaesthesiology residents from 3 medical schools participated in the study (mean age, 27.5 years; male, 68.9%). The majority of residents (57.8%) had undertaken an anaesthesiology attachment during undergraduate training. Many residents (57.8%) selected anaesthesiology as their first choice for specialty training, primarily because they felt it held good career prospects (62.2%). An appreciable minority of residents (24.4%) were not happy with their choice of specialty, and all residents expressed dissatisfaction with some aspect of their residency training. Common reasons for dissatisfaction related to the quality of the teaching programme (60.0%), the working conditions of the hospital (65.9%), and the unavailability of teaching and equipment and consumables (91.1%). Most residents (66.7%) reported they had inadequate exposure to patients who required anaesthesiology, and many residents (44.4%) reported that consultants were not available for consultation during working hours.

Conclusions
While most anaesthesiology residents in Ethiopia are happy with their specialty, many were dissatisfied with key aspects of their residency training. The results of this survey provide valuable insights into aspects of residency training that could be improved to increase its quality and improve the satisfaction of residents.

Keywords: anaesthesia workforce, anaesthesia crisis, anaesthesiology residency training, Ethiopia

Introduction

Anaesthesiologists are skilled medical doctors who play a critical role in monitoring and managing patients who are undergoing surgical procedures, radiological imaging or treatment, or receiving care in an intensive care unit. However, the number of trained physician anaesthesiologists is limited in low-income countries.[1]-[3] As of 2017, Ethiopia had only 21 physician anaesthesiologists working in the country's government and private hospitals[4] and only 47 residents in training in anaesthesiology.

Both systemic and physician-level factors may account for the low number of anaesthesiology physicians in Ethiopia. Anaesthesiology training for physicians in Ethiopia started in 1991, but until recently has only been available at

Table 1. Demographics and anaesthesia exposure before residency among anaesthesiology resident physicians in Ethiopia, September 2017 (N=45[a])

Category	Statistic
Female, n (%)	14 (31.1)
Male, n (%)	31 (68.9)
Age, years, mean ± SD	27.5±2.2
Year of residency, n (%)	
1	23 (51.1)
2	9 (20)
3	13 (28.9)
Marital status, n (%)	
Married	17 (37.8)
Single	28 (62.2)
Year of service before residency, mean ± SD	1.3±1.6
Had anaesthesia attachment in medical school, n (%)	26 (57.8)
Duration of anaesthesia attachment in medical school, days, mean ± SD	12±7.0

SD, standard deviation

[a]There was a total of 47 anaesthesiology residents in Ethiopia at the time; therefore, this number represents 95.7% of all physician anaesthesiology trainees in the country during the study period.

Table 2. Undergraduate medical school training sites of anaesthesiology resident physicians in Ethiopia, September 2017 (N=45[a])

Medical school training site	n (%)
Bahirdar University	2 (4.4)
Addis Ababa University	17 (37.8)
Gonder University	5 (11.1)
Harmaya University	2 (4.4)
Hawassa University	3 (6.7)
Jimma University	11 (24.4)
Mekelle University	5 (11.1)

[a]There was a total of 47 anaesthesiology residents in Ethiopia at the time; therefore, this number represents 95.7% of all physician anaesthesiology trainees in the country during the study period.

Addis Ababa University College of Health Sciences and has had a low intake of physician trainees compared with other residency programmes.

A lack of awareness about anaesthesiology among medical students may contribute to the low uptake of this speciality. Exposure to anaesthesiology during medical school training substantially increases medical students' interest in the speciality.[2],[5],[6] However, in Ethiopia, a departmental attachment in anaesthesiology is not included in all medical school programmes, there is no countrywide standardized curriculum in anaesthesiology, and undergraduate medical trainees have few or no encounters with physician anaesthesiologists. Further, most of the anaesthesiology care in Ethiopia is provided by nonphysicians, which reduces training opportunities for anaesthesiology residents.

The number of residents specializing in anaesthesiology in Ethiopia has increased in recent years with the opening of new anaesthesiology residency programmes at Jimma University Hospital in 2015 and St. Paul's Hospital Millennium Medical College in 2016. Nevertheless, the number of physician anaesthesiologists in Ethiopia remains low. An understanding of the factors that influence physicians to specialize in anaesthesiology is essential to address the unmet need for high-level anaesthesiology services in the country. The purpose of this study was to identify factors influencing residents' choice of anaesthesiology as a speciality and to describe the challenges that anaesthesiology residents face during their training.

Methods

This cross-sectional survey was conducted from 1 September to 30 September 2017, among anaesthesiology residents from the 3 universities in Ethiopia that have an anaesthesiology residency programme. In total, 47 residents were enrolled in anaesthesiology residency programmes; all were approached to request their participation in this study. Each resident was asked to complete a self-administered, semi-structured, 3-part, printed questionnaire that was developed based on a tool used in a similar study conducted in several Asian countries.[5] Part 1 of the questionnaire included questions on demographic characteristics, year of residency, and prior experience with anaesthesiology. Part 2 included questions about the choice of speciality, the reasons for preferring anaesthesiology; participants were allowed to select more than 1 reason from the list and satisfaction with their choice. Part 3 assessed the residents' teaching and working environments, including the availability of equipment, consumables, and supervision by consultants. Part 3 also included questions about whether the resident would recommend that other physicians select anaesthesiology as a speciality and about their career plans.

Data management and statistical analysis

Responses to the questionnaires were reviewed for clarity and transcribed into a dedicated study database. All data management and statistical analyses were conducting using SPSS Statistics for Windows, version 20.0 (IBM Corp., Armonk, NY, USA).

Ethical considerations

Ethical approval to conduct this study was granted by the Institutional Review Board of Addis Ababa University College of Health Sciences in Ethiopia. Written informed con-

Table 3. Factors affecting the choice of anaesthesiology as a career among anaesthesiology resident physicians in Ethiopia, September 2017 (N=45[a])

Factors for choosing anaesthesiology	n (%)
Good future prospects	28 (62.2)
Interest in critical care	22 (48.9)
Interest in the subject	20 (44.4)
Broad clinical spectrum	20 (44.4)
Opportunity to do procedures	10 (22.2)
Zero service year	9 (20)
Influence of role model, peer, or family	8 (17.8)
Teaching opportunities	6 (13.3)
Less patient contact	5 (11.1)
Opportunity for overseas placement	2 (4.4)
Good and flexible working hours	2 (4.4)
Unavailability of other specialty choices	2 (4.4)
Time for family	1 (2.2)
Easy subject	0

[a]There was a total of 47 anaesthesiology residents in Ethiopia at the time; therefore, this number represents 95.7% of all physician anaesthesiology trainees in the country during the study period.

Table 4. Experience among first-, second-, and third-year anaesthesiology residents with essential procedures in Ethiopia, September 2017 (N=45a)

Category	Mean ± SD frequency of procedures performed by individual residents
First-year residents	
Central line insertion	0.91±2.54
Epidural catheter insertion	0
Peripheral nerve block	0.36±0.95
Second-year residents	
Central line insertion	3.0±1.4
Epidural catheter insertion	2.2±1.6
Peripheral nerve block	10.3±12.7
Third-year residents	
Central line insertion	26.0±52.4
Epidural catheter insertion	12.7±15.6
Peripheral nerve block	12.5±15.8

SD, standard deviation

[a]There was a total of 47 anaesthesiology residents in Ethiopia at the time; therefore, this number represents 95.7% of all physician anaesthesiology trainees in the country during the study period.

sent was provided by study participants before they engaged in any study procedures. No identifying information was included on the questionnaire, and participants' identities were kept confidential.

Results

In total, 45 of the residents (95.7%) present in Ethiopia participated in the survey; 4 residents who were in training abroad were not included in the study. Most residents were young (mean age, 27.5 years), single (62.2%), and male (68.9%) (Table 1). About half of the participants were first-year residents, and most (57.8%) had a brief anaesthesiology attachment in medical school (mean duration of attachment, 12 days). Anaesthesiology residents came from 7 medical schools across Ethiopia (Table 2).

Choice of anaesthesiology

Twenty-six respondents (57.8%) chose anaesthesiology as their first choice of speciality, and 19 respondents (42.2%) chose anaesthesiology after failing to enrol in their first-choice speciality, including paediatrics, obstetrics and gynaecology, and surgery. The primary reasons for choosing to specialize in anaesthesiology included the perception of good career prospects (62.2%), an interest in critical care medicine (48.9%), an interest in the subject matter (44.4%), and the fact that it encompasses a wide clinical spectrum (44.4%) (Table 3). Most residents (75.6%) reported that they were happy with their choice of anaesthesiology; women were more likely than men to report being happy with their choice of speciality (85.7% vs 71.0%; P=0.01). A higher proportion of single residents were happy with their choice of speciality compared with married residents (78.6% vs 70.6%; P=0.01); second-year residents (100%) were more likely than first-year residents (69.9%) and third-year residents (69.2%) to be happy with their choice (P=0.162). The most common reasons for dissatisfaction with residency training were a lack of equipment and the overlap in scope of practice between physician and nonphysician anaesthesiologists.

Teaching and working environment

All 45 participants reported being dissatisfied with some aspect of their residency programme. Reasons for dissatisfaction included an inadequate number of consultants and the unavailability of consumables (60.0%), poor working conditions in the hospitals where they were doing clinical rotations (65.9%), and inappropriately equipped hospitals that compromised teaching and learning (91.1%). The residents were asked if central lines, epidural catheters, and nerve block needles had been purchased by their hospitals, and all reported that their hospitals had never purchased any of these. The majority of residents (66.7%) reported that their exposure to surgical patients in the operating room during clinical rotations was not adequate, and many residents (44.4%) reported that consultants were not available for consultation during working hours. Residents reported

performing invasive procedures primarily during their final year of residency (Table 4).

Most residents (78%) reported that they would recommend anaesthesiology residency training to other physicians, and most (82%) reported that they would not change careers after obtaining their qualification. Among residents who stated that they planned to change careers, reasons cited included the stressful nature of the field, the lack of recognition from society, and low income generation.

Discussion

In this study, which was the first to investigate factors influencing the choice of anaesthesiology as a career choice among physician trainees in Ethiopia, we found that while most anaesthesiology residents were satisfied with their choice of speciality and would recommend it to other physicians, important challenges in anaesthesiology residency training remained. Key challenges included a lack of equipment and inadequate supervision by consultant anaesthesiologists. Despite these challenges, the number of anaesthesiology residents has increased in recent years, in tandem with an increase in the number of medical schools (from 2 in 2003 to 8 in 2009).[6] The anaesthesiology residents that we surveyed came from 7 different universities, which suggests that the expansion of medical training in Ethiopia has had a positive effect on the number of physicians specializing in anaesthesiology.

We found that just over half of residents selected anaesthesiology as their first choice of speciality, which was similar findings from a study done in Hong Kong in which 63% of residents chose anaesthesiology as their first choice.[7] We speculate that exposure to the field of anaesthesiology during undergraduate training increases the likelihood that a physician will choose anaesthesiology as a speciality, a trend which was observed in a study of anaesthesiology trainees from Rwanda.[10] In our study, exposure to the field of anaesthesiology during undergraduate training seemed to favour physicians' selection of anaesthesiology as speciality. A disproportionately higher number of anaesthesiology residents came from undergraduate institutions that had a residency programme in anaesthesiology (i.e., Addis Ababa University and Jimma University) than from institutions that did not have such a programme. Further, the majority of residents had completed an anaesthesiology attachment during their undergraduate training.

Many residents felt that anaesthesiology held good prospects for career development, with over 60% of respondents citing this as a reason for choosing this speciality. These findings were similar to those of a study of Indian anaesthesiology residents,[5] but they differed from another study of anaesthesiology residents in India, in which economic security was the primary reason for selecting the speciality.[8] Previously, the field of anaesthesiology was not well understood or highly valued among medical students in Ethiopia.[9] However, this perception may be changing due to the expansion of critical care and surgical medicine and the consequent increased demand for anaesthesiologists in the country. Ethiopia's current health sector developmental plan projected a need for 309 anaesthesiologists by 2020 to provide safe and high-quality anaesthesiology care.[14] To achieve this goal, physicians have been allowed to join the residency programme in anaesthesiology without the requisite 1 year of clinical service. The impact of this new policy was evident in our study participants, among whom 45% had not done any clinical service before starting residency training.

While anaesthesiology may be gaining popularity as a clinical speciality in Ethiopia, anaesthesiology residents, nevertheless, expressed dissatisfaction with their residency training, a finding that contrasted with that of a Taiwanese study in which more than 70% of residents expressed satisfaction with their training.[10] A major reason for dissatisfaction among Ethiopian residents was the lack of mentorship from consultants, which contrasts markedly from the experience of Taiwanese residents, among whom 85.3% received learning support from consultants. In Ethiopia, anaesthesiology consultants are responsible for critical care units, which may explain why, in our study, many residents reported that consultants were not available during working hours. Another reason for dissatisfaction cited by many of our study participants was poor working conditions, including the lack of teaching equipment and consumables. In Ethiopia, consumables requested by hospitals are purchased through a central purchasing agency. The volume of consumables and equipment requested by these anaesthesiologists is low relative to that requested by other medical specialities, and we speculate that this diminishes the priority placed on anaesthesiology-related requests.

An appreciable minority of residents, 22%, would not recommend specialist training in anaesthesiology to other physicians, primarily due to the overlap in scope of practice among physician and nonphysician anaesthesiologists. In Ethiopia, programmes for physician and nonphysician anaesthesiologists are led by different clinical departments that provide overlapping curricula. This overlap in training results in a poor delineation between the cadres of anaesthesiologists and reduces training opportunities for anaesthesiology residents. In a study done in Hong Kong, 70.4% of trainees indicated that they would advise interested junior colleagues to take up anaesthesiology as a career,[7] which aligns with our study finding that 78% of particpants would make a similar recommendation. It is surprising that this many residents recommend the speciality despite being dissatisfied; 82.2% were planning to continue anaesthesia practice after graduation, which differed from a study in India where 91.5% expressed willingness to practice anaesthesia after graduation.[11] Some of the reasons for the change of career were unavailability of consumables, the stressful nature of the field, a lack of recognition from society, and low income generation.

Conclusions

Our study findings revealed that, in a setting of increasing demand for anaesthesiologists, most anaesthesiology residents in Ethiopia are happy with their speciality and would recommend it to other physicians. Undergraduate expo-

sure to the field of anaesthesiology may have been linked to choosing this speciality. Nevertheless, many residents expressed dissatisfaction with the working conditions of their hospitals and were concerned about the lack of consultant supervision as well as inadequate access to operating theatre experience. Incorporating anaesthesiology attachments into undergraduate medical curricula and improving the quality of anaesthesiology residency training will increase the number of physician anaesthesiologists in Ethiopia.

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