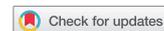


Perceptions of final-year UKZN medical students about anaesthesia as a specialty choice

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Background: South Africa suffers from a drastic shortage of anaesthesiologists. This shortage has a major impact on the provision of safe, timeous and appropriate surgery for the population. One factor implicated in this shortage may be the difficulty in appropriate recruitment of trainees.

Methods: A questionnaire-based cross-sectional study was conducted among the final-year medical students at the University of KwaZulu-Natal (UKZN), for the year 2013.

Results: A total of 112 final-year medical students participated in the study. The majority (93%) of the medical students would like to specialise in the future. Anaesthesiology ranked fourth in popularity among the specialties presented to the students. The students' opinion of the key positive attributes of anaesthesiology was that it was interesting (26.8%), mentally challenging (22.3%) and afforded good working hours (18.8%). The key negative attributes of anaesthesiology highlighted by the students were that it was boring (21.4%), stressful (20.5%) and frightening (15.2%). The biggest influence on the medical students' perceptions of anaesthesiology was the medical school rotation, with the need for longer duration of exposure, highlighted by 24 (21.4%) of the students.

Conclusion: The perceptions of medical students concerning anaesthesia are multi-faceted, with the undergraduate anaesthetic rotation viewed as the biggest influence on their perceptions regarding anaesthesia. All anaesthetists should strive to improve the discipline profile, change the misconceptions and enhance the attractiveness of the specialty amongst medical students from foundation level upwards.

Keywords: anaesthesia, education, medical students, perceptions, workforce shortage

Introduction

There is a drastic shortage of anaesthesiologists in South Africa, with a current estimate of 1 242 specialist anaesthesiologists, according to the South African Society of Anaesthesiologists (personal communication). This equates to 1 specialist to about 44 000 of the population in South Africa. However, this ratio might be worse than it seems as some of these specialists are either practising abroad or may not be in active practice. This shortage is compounded by the skewed distribution of these specialists across the public and private sectors in favour of the latter. In addition, the scope of practice of anaesthesiologists has expanded to include domains outside theatre, namely ICU, trauma units and pain clinics. As primarily a service discipline, this shortage has a major impact on the provision of safe, timeous and appropriate surgery for the population.

One of the factors implicated in this shortage is the difficulty in appropriate recruitment of trainees. Therefore, understanding how trainees select disciplines in which they wish to specialise might be insightful. Previous studies have looked at factors that influence the career preferences of medical graduates.^{1–3} Such factors include the individual's characteristics, perceived benefits of the discipline, attractiveness of particular specialties, and exposure to a specialty in the undergraduate medical curriculum. An understanding of such factors in the local context could have important implications for future recruitment into anaesthesiology. Our study aims to understand the perceptions of final-year medical students at UKZN for the year 2013, with regard to anaesthesiology as a specialty choice.

Methods

Following UKZN Biomedical Research Ethics Committee approval (Ref BE 267/13) and permission from the Dean of UKZN medical students, all final-year medical students at UKZN for the year 2013 were approached for their voluntary participation in the study. A self-administered questionnaire was then distributed to available medical students in the last month of their final year. The questionnaire focused on four areas: demographics of the students, popularity of anaesthesiology as a career choice, factors influencing their choice of specialty, and factors influencing the medical students' perceptions towards anaesthesiology.

The data collected were analysed using SPSS® version 21 (IBM Corp, Armonk, NY, USA). Means are presented for continuous variables and frequencies (%) are presented for categorical variables. Chi-square tests were used to compare groups.

Results

A total of 112 UKZN final-year medical students, from a class of 200, participated in the study, giving a response rate of 56%. The remaining 88 students did not participate as they were either at decentralised sites, on-call or absent. All 112 questionnaires were analysed. The age range of the respondents was 20–28 years, with a mean age of 23 years. Females constituted 66% ($n = 74$) of the cohort. Racial distribution was as follows: Black 61.6% ($n = 69$), Asian 31.3% ($n = 35$), Coloured and White 3.6% each ($n = 4$).

The majority of the students (93%; $n = 104$) indicated that they would like to specialise in the future. The eight students who

planned not to specialise completed all aspects of the questionnaire and were thus included in the analysis. The most popular first-choice option was Obstetrics & Gynaecology, followed jointly by Internal Medicine and Paediatrics (Table 1). Anaesthesiology (8%) ranked fourth as a first-choice option among the specialties presented to the students.

As not everyone is likely to end up with their first career choice, we looked at the first three career choices of the students. The most popular specialties appearing within the first three choices were Paediatrics (31.3%), Internal Medicine (26.8%) and General Surgery (34.8%). Twenty-three students (20.5%) had Anaesthesia within their top three speciality choices, making it the sixth most popular discipline in this regard.

The reasons for the choice of the specialty are reflected in Table 2. Students were presented with alternatives constructed from previous studies.^{3,4} The top three first-choice reasons were the undergraduate rotation in medical school, time for family, and

Table 1: First, second and third speciality choices of students

Specialty choice	1st	2nd	3rd	Total in first 3 choices
Obstetrics & Gynaecology	14	5	8	27
Internal Medicine	12	8	10	30
Paediatrics	12	14	9	35
Anaesthesiology	9	6	8	23
General Surgery	7	11	11	29
Dermatology	6	8	5	19
Orthopaedics	6	3	7	16
Cardiology	5	10	11	26
Cardiothoracic Surgery	5	4	1	10
Trauma Surgery	5	3	0	7
General Practitioner	4	2	8	14
Paediatric Surgery	4	4	1	9
Plastic Surgery	4	1	1	6
Psychiatry	3	8	7	18
Ear Nose & Throat	3	3	3	9
Neurology	3	1	5	9
Occupational Health	3	1	0	4
Ophthalmology	2	3	4	9
Urology	2	2	3	7
Neurosurgery	2	0	3	5
Endocrinology	1	4	0	5
Pulmonology	0	3	2	5
Family Medicine	0	3	0	3
Radiology	0	2	0	2
Chemical Pathology	0	1	1	2
Vascular Surgery	0	0	2	2
Haematology	0	0	1	1
Medical Administration	0	0	0	0
Nephrology	0	0	0	0
Total	112*	110*	111*	

*The discrepancy in the column totals is as a result of one medical student who only chose a first and third career option; and another student's first career choice as a general practitioner, with no second or third options.

Table 2: Reasons for choice of speciality

Response	1st		2nd		3rd	
	n	%	n	%	n	%
Undergraduate rotation in medical school	26	23	11	10	7	6
Time for family	19	17	14	13	16	14
Intellectually stimulating or challenging	13	12	11	10	12	11
Patient contact	12	11	8	7	6	5
Earning potential	10	9	16	14	11	10
Diversity of clinical spectrum	8	7	4	3	7	6
Influence of mentor or role model	6	5	4	3	6	5
Predictable working hours as a senior	5	4	4	3	4	3
Prestige of speciality	4	3	6	5	4	3
Time for leisure and personal lifestyle	3	2.6	12	11	12	11
Opportunity to do procedures	2	1.8	11	10	7	6
Research potential	2	1.8	3	2.6	3	2.6
Opportunity of overseas placement	1	0.9	5	4	7	6
Influence of family	1	0.9	1	0.9	2	1.8
Teaching opportunity	0	-	2	1.8	5	4
*Other (please specify)	0	-	0	-	1	0.9
No response	0	-	0	-	2	1.8
Total	112		112		112	

*Not specified by the student.

the intellectually stimulating/challenging nature of the discipline. In looking at the first three choices of all the students overall, time for family, the undergraduate rotation in medical school and the earning potential were most commonly expressed.

The remaining issues focused specifically on anaesthesiology. The biggest influence on the medical students' perceptions of anaesthesiology was the medical school rotation, followed by peer and television influence as depicted in Table 3. The mean duration of exposure to anaesthesia was nine days (range: 4–14 days), with 109 (97.3%) students deeming this exposure to be insufficient.

The students were asked to rank positive and negative features from supplied lists that best described anaesthesiology, such

Table 3: Influences on the medical students' perceptions of anaesthesiology

What influences the perceptions of medical students' about anaesthesiology?	Students considering this a factor, n (%)	95% confidence interval
Medical school rotation	108 (96.4)	93–99
Peers	35 (31.3)	23–39
Television	34 (30.4)	22–39
Internet	32 (28.6)	20–37
Family	11 (9.8)	4–15
Social network	6 (5.0)	0.9–9

lists being constructed from previous studies.^{3,5} The three top positive features were that it was interesting ($n = 30$, 26.8%), mentally challenging ($n = 25$, 22.3%) and afforded good working hours ($n = 21$, 18.8%). The three top negative features were that it was dull/boring ($n = 24$, 21.4%), stressful ($n = 23$, 20.5%) and scary/frightening ($n = 17$, 15.2%).

Students were finally asked the open-ended question: 'What would encourage you to choose anaesthesia for future specialisation?' Varied responses were received. The three commonest themes that emerged in students' responses were the need for longer undergraduate exposure, more teaching, and better understanding of the discipline. The need for longer exposure as an undergraduate was highlighted by 24 of 66 students (36.3%) that provided responses. A group of students indicating nothing can be done offered reasons for their negative perceptions including 'because it is more exciting to be hands on than in the background', 'anaesthetists are painted as "helpers" or "assistants"' and 'there's no respect for it'.

Discussion

The purpose of this descriptive study was to understand the perceptions of final-year medical students at UKZN for the year 2013 with regard to anaesthesia as a preferred specialty choice.

Anaesthesiology (8%) ranked fourth in popularity as a first career choice among the specialties presented to the UKZN students. This was contrary to the findings of another South African study conducted by Dambisya *et al.* in 2003 where a very low number of medical students (1.2%) opted to pursue a career in anaesthesia.¹ A possible explanation for the difference in our results may be the improved profile of the discipline of anaesthesiology in South Africa over this time. However, similar to the Dambisya study, anaesthesiology was among the least preferred specialty in more recent studies among Ghanaian,² Nigerian³ and Pakistani⁴ medical students. This relative popularity of anaesthesia among the UKZN medical students may thus be indicative of a difference between South Africa and the countries in these other studies. No details are provided in these studies in respect of curricula and student rotations to allow meaningful

comparisons with our situation. The contribution of the lack of blinding of our students to the investigator also cannot be discounted.

However, our findings are in keeping with a multicentre UK study conducted by Cleland *et al.*, which ranked anaesthesiology fourth in popularity as a career choice among their 1 001 fifth-year medical students.⁵

The most popular specialties were obstetrics & gynaecology (12.5%), followed jointly by internal medicine (10.7%) and paediatrics (10.7%). This was echoed by a study in Nigeria, which showed that obstetrics and gynaecology (32.4%), paediatrics (19%) and internal medicine (12.4%) were among the most preferred specialty choices among final-year medical students.³ The much longer undergraduate exposures in these popular specialty choices in comparison with specialties like anaesthesiology may account for this relative popularity. A summary of relevant studies from the literature to serve as comparison with our study is depicted in Table 4.

Previous studies have looked at factors that influence the career preferences of medical graduates.^{1,2} Such factors include the individual's characteristics, personal interest, perceived benefits of the discipline, prestige, attractiveness of particular specialties, and exposure to a specialty in the undergraduate medical curriculum.^{3,4} The main reasons in our cohort (the undergraduate rotation in medical school, time for family and the intellectually stimulating/challenging nature of the discipline) are in keeping with other studies in this area.

Our students' opinion of the key positive attributes of anaesthesiology were that it was interesting, mentally challenging and afforded good working hours. In a Nigerian study, 61% of the final-year medical students were also of the opinion that anaesthesia was an interesting and an important specialty.⁶ The perceptions of the interesting nature of the specialty, together with it affording good working hours, may well be good marketing tools for anaesthesiology. Interestingly,

Table 4: Summary of findings from studies

Author and reference	Year	Country	Sample size	Population	Males: Females (%)	Age range (years)	Plan to specialise (%)	Anaesthesia popularity ranking	Preferred specialty choices
Dambisya ¹	2003	South Africa	364	1st–6th year	47:53	Not specified	89.8	8th	Surgery Medi- cine O&G
Nwasor ⁶	2010	Nigeria	88	Final year	80.7:19.3	26–35	92	Not specified	Not specified
Rehman ⁴	2011	Pakistan	771	1st–5th year	23.1:76.9	Not specified	Not specified	9th	Surgery Medicine Paediatrics
Oku ³	2014	Nigeria	105	Final year	69:31	27 +/- 4	91.4	7th	O&G Paediat- rics Medicine
Cleland ⁵	2014	UK	1329	1st year	41:59	17–21	Not specified	7th	Medicine GP Surgery
			1001	5th year	32.9:67.1	Not specified	Not specified	4th	Medicine GP Emergency Medicine
Abdul-Rah- man ²	2015	Ghana	183	Final year	54.8:45.2	18–37	84.9	9th	Surgery Paediatrics Medicine
Our Study	2016	South Africa	112	5th year	34:66	20–28	97.3	4th	O&G Medicine Paediatrics

Notes: O&G = Obstetrics & Gynaecology.
GP = general practitioner.

eight out of nine of our students who chose anaesthesia as their preferred career choice were females, possibly indicating an association of this gender bias with the reasons above.

The negative attributes of anaesthesiology highlighted by the students were that it was boring, stressful, frightening and perceived as behind the scenes. These sentiments were echoed by medical students in Ghana² and Nigeria.⁶ Nyssen *et al.* also identified anaesthesiology as a stressful specialty.⁷ Such negative perceptions need to be addressed if we are to attract and recruit more people into anaesthesia.

We found the undergraduate medical school rotation to have the biggest influence on the medical students' perceptions of anaesthesiology with the need for longer exposure as an undergraduate being consistently highlighted. Khan *et al.* in 2011 showed the positive influence of a two-week clinical clerkship of anaesthesia on changing the attitude of medical students towards the specialty of anaesthesia.⁸ Desalu *et al.* also showed a positive change in the perceptions that their Nigerian medical students had of anaesthesiology after their clinical clerkship.⁹ Hence, a positive undergraduate experience may well play a very important role in choice of future specialisation.

Further, it would be important to follow up medical students after they qualify, as the next most appropriate nexus for enticing them into the specialty would be their time as interns in anaesthesia. In a study by Reddy *et al.* in Durban, South Africa, there was an increase in the number of interns choosing a future career in anaesthesiology after their clinical rotation.¹⁰ The factors that influenced their choice of anaesthesia as a career were: positive patient outcomes, satisfaction from immediate results seen, intellectual content, hours/working conditions and no ward round or clinics. These factors could also be used in marketing the discipline to medical students at an earlier stage.

Completing the continuum onto specialisation, postgraduate registrars interviewed prior to starting their specialisation in anaesthesia in Pakistan were of the perception that anaesthesia was intellectually challenging; a very vast field; technology based; gave them financial security; a sense of control; involved teamwork and had clinical application of physiology and pharmacology.¹¹ Similarly 200 postgraduate students in India highlighted intellectual stimulation (22%) and earning potential (20%) as factors that influenced their career choice in anaesthesiology.¹² Again, such factors could also serve as positive reinforcement to medical students at an earlier stage.

A limitation of our study was that it was a single-centre study that focused only on the final-year medical students. The students were not blinded to the anaesthesiologist investigator and this may have created a bias towards anaesthesiology. A further limitation was a questionnaire response rate of 56%. Eight students who did not want to specialise completed the questionnaire and thus needed to be included in the analysis. This may have created a bias.

We recommend an increase in the duration of undergraduate exposure to anaesthesiology to enhance the attractiveness and popularity of anaesthesiology.

Conclusion

Anaesthesia remains a less popular choice as a career amongst medical students. Their perceptions regarding anaesthesia are multi-faceted, with the undergraduate anaesthetic rotation viewed as the biggest influence on their perceptions of anaesthesia. This knowledge of medical students' perceptions should form the basis for the development of strategies to enhance the attractiveness of the specialty of anaesthesiology.

All anaesthetists should strive to improve the discipline profile, change the misconceptions and enhance the attractiveness of the field from foundation level upwards, such that more trainees are attracted into the discipline.

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Received: 30-01-2017 Accepted: 11-04-2017