Who Wants to be a Surgeon? A Survey of Medical Students at the University of Nairobi, Kenya

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Abstract

Background:
In Sub Saharan Africa, surgical conditions account for a significant disease burden. Surgical workforce is however inadequate, and thus strategies such as attracting medical students to surgical specialties could avert the situation. This study determined the proportion of students interested in pursuing surgical career and factors that influence choice of this specialty.

Methodology
Four hundred and fifty medical students, from first to fifth year of study at the University of Nairobi, were each issued a self administered questionnaire designed to assess their specialty preferences, and factors influencing these choices.

Results:
The response rate was 385/450(85.6%). Surgery was the most popular specialty with 105(27.3%) students. Majority, 60(57%), of those who preferred surgery were in the preclinical years. Male students had a two-fold likelihood of selecting a surgical career compared to females.

Significant factors that attracted students to surgery instead of non surgical careers were prestige of the specialty ($p<0.001$), presence of a role model ($p=0.002$), and intellectual challenge ($p=0.005$). Main deterring factors were ease of raising a family ($p<0.001$), length of residency ($p<0.001$) and lifestyle of practice ($p=0.020$).

Conclusion:
Although surgery is the most preferred specialty among medical students at the University of Nairobi, there appears to be a declining interest among the clinical students. In order to attract and maintain student interest in the specialty, there is need for early and active mentoring.

Introduction

In Sub Saharan Africa, a significant proportion of disease burden is associated with surgical conditions (1,2). The estimate of 38 DALYs (disability adjusted life years) lost per one thousand people in Sub Saharan Africa due to surgical conditions is the highest compared to other regions of the world (2,3). The main cause of this burden is inadequate surgical work force (3). Africa has 24% of the global health burden but only 3% of the global health workforce whereas United States of America has 10% of the global health burden and 37% of the global health work force (3). Improving the recruitment of surgical trainees, through encouraging more medical students to pursue surgical careers, may help alleviate this shortage (4-6).

Undergraduate medical education has largely been ignored in Africa. There is paucity of published data on medical student career preferences, as opposed to Western countries here data on career trends can readily be accessed (7,8). In these countries, where declining student interest in surgical careers have been observed, active and early mentoring has been widely promoted as an important avenue for addressing the trend (7-9). Understanding medical students' career preferences and the factors influencing these choices helps surgical educators devise strategies aimed at attracting and maintaining student interest in surgical careers (5-9). Our study, aimed at determining medical student's interest in surgery at the University of Nairobi, Kenya, and the factors influencing choice of this specialty.

Methodology

Setting and participants: This study enrolled medical students at the University of Nairobi in Kenya, which runs a five year undergraduate degree program in medicine. In this study, students in all five years of study were enrolled. The survey was conducted between September and October 2009, coinciding with the last quarter of the 2008/09 academic year. In the 2008/09 academic year, there were 1557(874 male and 683 female) students. For this study we enrolled 450 students, ninety per year of study. All participants were informed of the aim of the

study and that their involvement was voluntary.

Procedure and Measures: Self administered questionnaires (printed) were disseminated and collected in classrooms for 1st to 5th year students. The survey took approximately 10 minutes to complete. Information collected included: gender, marital status, year of study, their preferred specialty, factors that influenced the choice, and timing of specialty choice. The participants were offered the following list of possible specialties: surgery, internal medicine, pediatrics, obstetrics and gynecology, public health, psychiatry, radiology, anesthesiology, pathology, microbiology, anatomy, physiology, biochemistry, ophthalmology, immunology and other (a write in option).

Option for 'not yet decided' was also included. These specialties were preselected as it was felt they would be clear and distinct for most students. The participants were allowed to choose only one specialty.

Regarding the factors influencing choice of the specialties, the students responded to the question "Did this factor influence your choice of the specialty?"

The response was either 'yes' or 'no' to a list that included: encouragement by teaching or clinical staff, role model in the specialty, job opportunities and financial rewards, prestige of the specialty, academic and research opportunities, intellectual challenge in the specialty, lifestyle of practice, gender distribution in the specialty, ease of raising up a family, ease of entry into residency, length of residency, lifestyle during residency, and further training required after residency. These factors were based on similar published studies (6-9).

Analysis: Data collected were analyzed using Statistical Package for Social Sciences version 17.0. Chi square test was used to evaluate gender differences as well compare those who chose surgery to those who chose other careers. In cases where the expected value of any cell was less than 5, the two-tailed Fisher's exact test was performed. A p-value≤0.05 was considered statistically significant.

Results

Demographics characteristics

Of the 450 questionnaires administered, 385 (85.6%) were returned. Male respondents were 217 (56.4%). The response according to year of study is summarized in Table 1. Only 58 (15.1%) students had not yet decided on their future careers.

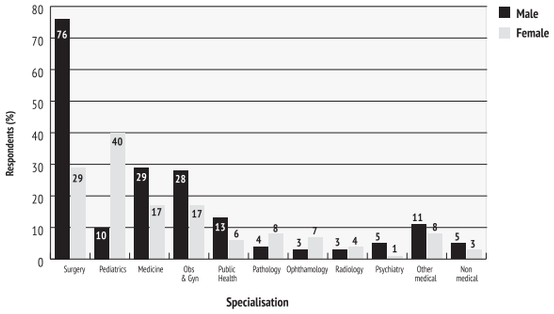

Figure 1: Specialty choices among male and female medical students

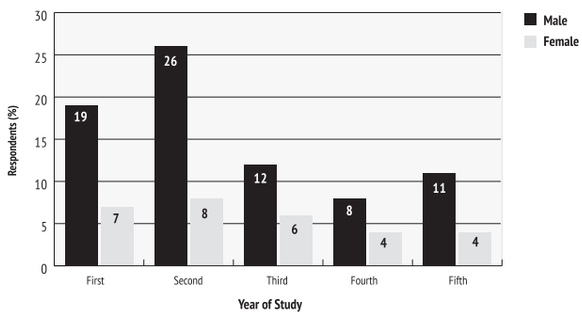

Figure 2: Choice of surgery according to the year of study

Choice of surgery

Surgery was the most preferred specialty (27.3%)(Figure 1). It was the most popular specialty among male students 76(35%), and the second most preferred choice among the female students 29(17.3%).Majority, 60(57%), of those who preferred surgery were in the preclinical years, before surgery clerkship rotation (Figure 2).

Timing of specialty choice

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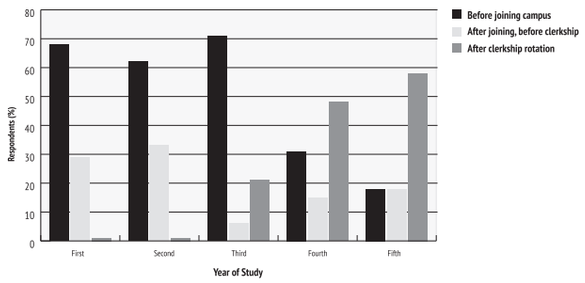

Figure 3: Timing of choice of surgery

Year of study	Male n(%)	Female n(%)	Total n(%)
First	38(55.9)	30(44.1)	68(100)
Second	52(58.4)	37 (41.6)	89(100)
Third	39(56.5)	30(43.5)	69(100)
Fourth	55(65.5)	29(34.5)	84(100)
Fifth	33(44.0)	42(56.0)	75(100)
	217(56.4)	**168(43.6)**	**385(100)**

Table 1: Response rate according to the year of study

Most students, 60 out of 105(57.1%), made their surgical career choice before joining medical school. Among those who were in the clinical years (third to fifth year), 19(42.2%) students considered this choice after their clerkship rotation in surgery. Figure 3 illustrates timing of choice of a surgical career according to year of study.

Factors influencing choice of surgery

Table 2 summarizes the factors influencing choice of surgery. The main determining factors were presence of role models 83(79%), intellectual challenge in the specialty 82(78.1%), prestige of specialty 75(71.4%), and availability of academic and research opportunities 75(71.4%). Factors that exerted minimal influence included length of residency 18(17.1%) and easy of entry into residency programmes 13(12.4%). Significantly more females than males considered gender distribution in the specialty ($p<0.001$). More preclinical students selected surgery because of availability of academic and research opportunities in the specialty ($p=0.025$).The other factors studied did not exhibit statistically significant between males and females or between preclinical and clinical students differences.

Choice of surgery versus choice of other careers

Table 3 compares the factors influencing choice of surgery versus other careers. Significant factors that positively influenced the choice of surgery included prestige of the specialty ($p<0.001$), presence of a role model in the specialty ($p=0.002$) and intellectual challenge of the specialty ($p=0.005$). Factors that negatively influenced choice of surgery consisted of ability of raising a family ($p<0.001$), length of residency training ($p<0.001$) and lifestyle of practice ($p=0.020$). In addition to the above mentioned factors, female students choosing surgery significantly considered gender distribution in the specialty than their colleagues who preferred other specialties ($p=0.002$).

Discussion

Career choice decision making process among medical students has been a focus of many investigators. The current study reveals that surgery is the most popular specialty among medical students in Kenya, and that more male than female students are attracted to a surgical career. This concurs with findings by other workers (5-9). The pattern of low application rates by women to surgical specialties is shaped by multiple factors, which include a lack of female role models and mentors (10), and perceived gender-based discrimination (11,12). Recently, particular attention has been given to the notion of students rejecting surgical careers because they do not offer a "controllable lifestyle" (13-15). Studies have reported that women were more likely than men to expect an interruption in their careers in order to raise children (15-19). In tandem with these studies are our findings that women significantly considered lifestyle of practice, ability to raise children, and length of residency.

The impact of role models in career choice among medical students cannot be overemphasized. In the current study, 79% of students who chose surgery were encouraged by role models. Exposure to role models during

	Male vs. female			Preclinical vs. clinical			Total
	Male n(%)	**Female n(%)**	*p-value*	**Preclinical n(%)**	**Clinical n(%)**	*p-value*	**n(%)**
Role model in the specialty	59(77.6)	24(82.8)	0.564	46(76.7)	37(82.2)	0.489	83(79.0)
Intellectual challenge	58(76.3)	24(82.8)	0.475	50(83.3)	32(71.1)	0.134	82(78.1)
Prestige of the specialty	57(75.0)	18(62.1)	0.190	45(75.0)	30(66.7)	0.350	75(71.4)
Academic/Research opportunities	53(69.7)	22(75.9)	0.534	48(80.0)	27(60.0)	0.025*	75(71.4)
Jobs & financial rewards	53(69.7)	19(65.5)	0.667	44(73.3)	28(62.2)	0.225	72(68.6)
Lifestyle of practice	37(48.7)	20(69.0)	0.062	34(56.7)	23(51.1)	0.572	57(54.3)
Further training after residency	36(47.4)	15(51.7)	0.990	30(50.0)	21(46.7)	0.735	51(48.6)
Encouragement by staff	35(46.1)	14(48.3)	0.838	28(46.7)	21(46.7)	1.000	49(46.7)
Ease of raising a family	23(30.3)	6(20.7)	0.327	16(26.7)	13(28.9)	0.801	29(27.6)
Lifestyle during residency	20(26.3)	9(31.0)	0.629	18(30.0)	11(24.4)	0.529	29(27.6)
Gender distribution in specialty	8(10.5)	19(65.5)	<0.001*	13(21.7)	14(31.1)	0.273	27(25.7)
Length of residency training	12(15.8)	6(20.7)	0.551	8(13.3)	10(22.2)	0.232	18(17.1)
Ease of entry into residency	9(11.8)	4(13.8)	0.786	8(13.3)	5(11.1)	0.732	13(12.4)

*Table 2: Factors determining choice of surgery *statistically significant.*

medical school is strongly associated with a medical student's choice of clinical field for residency training (19). Medical students encouraged by role models to pursue a surgical career are less likely to be discouraged by lifestyle, time commitment, call schedules, or length of residency (6,19). This study further reinforces the relevance of role modeling in encouraging medical students to consider surgical careers. We however found that less than half of the students were encouraged by teaching or clinical staff. This raises the question: where are the role models? Although our study did not explore this, the students may have been influenced by role models who are not necessarily part of medical school faculty.

Students consider the level of prestige they believe a specialty has when choosing a career, and surgery is frequently ranked as the highest in status (8,9). Prestige is captured as respect for surgeons by patients and other physicians (8,9,20). In the current survey, both male and female students who selected surgery as a career significantly considered this prestige. Reports by other authors have reported that students who value prestige of their future profession are five times more likely to choose surgery or a surgical specialty over a primary care specialty (21). Social prestige appears to increase in importance among medical students after brief interaction with surgery faculty (22).

Studies examining timing of career choices among medical students have suggested that career interests formed before entry into medical school may be predictive of eventual career choices (10,23,24). In the current study 57.1% of students who had selected surgery had interest in this career even before entry into medical school. Other studies have also reported that a student's desire to practice surgery was largely determined before entry into medical school and that students who expressed interest in nonsurgical careers were less likely to have their areas of specialty solidified to the same extent at that time (10,22). Clerkship rotations in surgery have also been reported to influence specialty choice, especially through exposure to surgical procedures and mentorship (25,26). In our study 42.2% of the clinical students who selected surgery developed interest in the specialty after clerkship rotation. Thus a positive surgical clerkship experience is crucial in attracting students to the specialty.

Our study revealed that most students interested in surgery are in the preclinical years and that there is reduced interest among clinical students. This thus implies that a high number of students entering medical school want a surgical career but along the way some are lost to other specialties. The only significant factor explaining why

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	Male students			Female students			Total		
	Surgery n (%)	Others n (%)	*p-value*	Surgery n (%)	Others n (%)	*p-value*	Surgery n (%)	Others n (%)	*p-value*
Role model in the specialty	59(77.6)	69(62.7)	0.031*	24(82.8)	68(61.3)	0.030*	83(79.0)	137(62.0)	0.002*
Intellectual challenge	58(76.3)	63(56.8)	0.006*	24(82.8)	76(68.5)	0.129	82(78.1)	139(62.6)	0.005*
Prestige of the specialty	57(75.0)	48(43.2)	<0.001*	18(62.1)	39(35.1)	0.009*	75(71.4)	87(39.2)	<0.001*
Academic/Research opportunities	53(69.7)	72(64.9)	0.487	22(75.9)	65(58.6)	0.087	75(71.4)	137(61.7)	0.086
Jobs & financial rewards	53(69.7)	75(67.6)	0.754	19(65.5)	65(58.6)	0.496	72(68.6)	140(63.1)	0.330
Lifestyle of practice	37(48.7)	72(64.9)	0.028*	20(69.0)	78(70.3)	0.891	57(54.3)	150(67.6)	0.020*
Further training after residency	36(47.4)	42(37.8)	0.194	15(51.7)	39(35.1)	0.102	51(48.6)	81(36.5)	0.058
Encouragement by staff	35(46.1)	41(36.9)	0.213	14(48.3)	50(45.0)	0.756	49(46.7)	91(41.0)	0.333
Ease of raising a family	23(30.3)	50(45.0)	0.042*	6(20.7)	80(72.1)	<0.001*	29(27.6)	130(58.6)	<0.001*
Lifestyle during residency	20(26.3)	37(33.3)	0.306	9(31.0)	31(27.9)	0.742	29(27.6)	68(30.6)	0.578
Gender distribution in specialty	8(10.5)	13(11.7)	0.801	19(65.5)	38(34.2)	0.002*	27(25.7)	51(23.0)	0.587
Length of residency training	12(15.8)	45(40.5)	0.001*	6(20.7)	51(45.9)	0.014*	18(17.1)	96(43.2)	<0.001*
Ease of entry into residency	9(11.8)	21(18.9)	0.195	4(13.8)	22(19.4)	0.457	13(12.4)	43(19.4)	0.117

*Table 2: Factors determining choice of surgery *statistically significant.*

more preclinical students chose surgery was presence of research and academic positions. Indeed majority of the lecturers in preclinical years are surgeons. Some departments like Human Anatomy had more that 50% of the academic staff being surgeons (27). These teaching positions may have attracted the students to surgery. It is also possible that the clinical students who initially had desire to do surgery, may have developed interest in other specialties after clerkship in these specialties, or some factors in the medical school discouraged them from surgical careers.

Our study has the following limitations. Firstly we measured specialty preference at one point in time. It is known that specialty choice does not remain stable over the course of medical education, and students tend to use their clinical years as well as internship period to refine their specialty preferences (28). Secondly, structured questionnaires may not have captured some of the subtleties of views about career choices and a more open-ended interview format might be more suitable in capturing the essence of what the respondents thought about the specialty. This study however serves as a pilot for future, more comprehensive cohort studies following up the students from the early years in medical school to the actual time they choose the specialties.

Conclusion

Although surgery is the most preferred specialty among medical students at the University of Nairobi, there appears to be a declining interest among the clinical students. Role models and social perceptions of surgeons are the main attractants while lifestyle considerations deter students from selecting surgical careers. In order to attract and maintain student interest in the specialty, there is need for early and active mentoring of the students as well as address the factors that discourage students from surgery.

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