

# Specialty Choices: Patterns and Determinants among Medical Undergraduates in Enugu Southeast Nigeria

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ABSTRACT

**Background:** Specialty choices of medical undergraduates are important in planning educational programs and human resources for health-care delivery. The aim of this study was to investigate the specialty preferences of medical undergraduates and determine the factors that influenced their specialty choices.

**Methods:** This was a cross-sectional questionnaire-based survey carried out among final year medical undergraduates of University of Nigeria Enugu Campus, Enugu Nigeria. A self-administered questionnaire was used for data collection from the participants. Sociodemographic characteristics, decision to specialize, the timing of the decision, specialty choices and factors influencing these choices were evaluated. Chi-squared test and unpaired *t*-test were used to analyze the observations. **Results:** Surgery and surgical specialties 79 (52%) were the most preferred specialties among the students. This was followed by obstetrics and gynecology 22 (14.5%) and public health 16 (10.5%). Personal interest in a specialty, personal abilities/competence, and career prospects were the most influential determinants of specialty choices. The career choices of male students were preferentially influenced by family/societal expectations (*P* = 0.03) and diversity of patients (*P* = 0.01). Low work hours significantly (*P* = 0.04) influenced the career choices of female students. **Conclusion:** Surgical specialties, obstetrics and gynecology, and public health were the most preferred specialties among our participants. The most important determinants of specialty choices were personal interest, personal abilities, and career prospects.

**KEYWORDS:** Enugu, medical undergraduates, Nigeria, specialty choices

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## INTRODUCTION

Medical training is one of the core components of the health system of any country. During medical training, undergraduate students are exposed to a wide range of medical specialties. Their experiences during the preclinical and clinical training have a major impact on the specialty choices they make when they finish their basic medical education.<sup>[1,2]</sup>

Specialty choice of medical undergraduates is of interest to both medical educators and health services providers.<sup>[3]</sup> The specialty preferences of medical undergraduates and young medical graduates reflect the pattern of distribution of specialist in the future work-force in the the health-care system.<sup>[4,5]</sup> These choices also have implications in the maintenance of balance in the availability and demand for


specialist,<sup>[4,5]</sup> an important aspect in the the provision of comprehensive specialty health services. The information derived from studies on specialty choice of medical undergraduates is important in planning, setting priorities and provision of appropriate specialty mix within the medical workforce. Furthermore, the information can also assist in curriculum development and reviews as well as in medical education planning.<sup>[4]</sup> The choice of a future specialty in medical practice can be a daunting challenge for medical undergraduates and young graduates as there are many factors to consider.

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Identifying the factors that affect specialty choices and understanding the dynamics of specialty career decision can facilitate interventions aimed at influencing career choices. Consequently, these interventions may modulate the career aspiration of medical undergraduates to meet specialist workforce needs.<sup>[6]</sup> Diverse factors influence medical undergraduates' choice of specialty. In published reports, personal interest, intellectual challenge, the prestige of specialty, good clerkship experience, financial rewards, interest in research, reputation and prestige of specialty and the effect of a role model were documented as factors that influence the choice of specialty.<sup>[4,7-9]</sup> Most of the published reports on specialty preference in Nigeria have been focused on specific specialties<sup>[10]</sup> or on medical graduates.<sup>[11]</sup> The paucity of reports on specialty preferences among medical undergraduates in the sub region and the relative weight of factors that influence these choices necessitated this study. The information is important for policymakers and administrators in planning the health-care workforce and medical education programs for the provision of equitable and qualitative specialist health-care services in the community. Therefore, the aim of this study was to determine the specialty preferences among final year medical undergraduates in our institution and identify the factors and their relative weights that influenced these choices.

## METHODS

### Setting and participants

We conducted a descriptive cross-sectional study on final year medical undergraduates of College of Medicine of the University of Nigeria, Enugu Campus, Enugu, Nigeria in August 2015. University of Nigeria is the first indigenous University in Nigeria founded in 1960. The College of Medicine which was established in 1970 has over 1000 students, and graduates 150–200 students annually. The participants were 152 final year medical undergraduates who were selected randomly during a revision tutorial in preparation for their final professional examination in August 2015. Final year undergraduates were purposively selected because they have been exposed to all the medical specialties, having concluded their preclinical and clinical rotations.

### Data collection

After clearance from the institutional research and ethics committee, we used a structured open-ended, self-administered questionnaire for data collection. The first part of the questionnaire comprised of the sociodemographic profile of the participants such as age, gender, religion, marital status, parents' level of education and occupation, decision to specialize, timing of decision, first and second specialty preferences.

In the second part of the questionnaire, participants were asked to indicate the degree to which a list of 20 factors influenced their first ranked specialty choice. Responses were self-rated on a five-point Likert scale ranging from 1 (not significant) to 5 (very significant).

From extensive literature review, about 30 common factors that can influence specialty choice were identified. The questionnaire was initially pretested on 20 volunteer 5<sup>th</sup> year medical undergraduates for content validity. They commented on the relevance, appropriateness, and comprehensiveness of the items. The questionnaire was then modified into its final form with 20 factors based on their feedback. It was also subjected to review by a panel of experts.

After explaining the study objectives, a written informed consent was obtained from each participant. The participants were assured of confidentiality and that they were free to decline participation. A total of 155 questionnaires were distributed and 152 were completed and returned (98% response rate).

### Data analysis

The statistical package for social sciences SPSS version 17 (SPSS Inc. Chicago IL, USA) was used to analyze the data. Quantitative variables were expressed as means and standard deviations. Data were presented in the form of tables. Statistical test which was used for data analysis was Chi-square test at 95% confidence level.

Comparison of means was done using the unpaired *t*-test (independent *t*-test). The value of  $P < 0.05$  was considered statistically significant.

## RESULTS

The participants' ages ranged from 22 to 37 years with mean age of  $25.8 \pm 2.5$  years. The mean age for males was  $26.8 \pm 2.9$  years, whereas for females, it was  $23.4 \pm 2.6$  years, and the difference was significant ( $P = 0.03$ ). The male students were 110 (72.4%), whereas the female students were 42 (27.6%), (gender ratio = 2.6:1). Only 6 (3.9%) students were married and they were all females. One hundred and forty-eight (97.4%), 2 (1.3%), and 2 (1.3%) of the participants were Christians, Muslims, and other religions, respectively. Majority of participants' parents were unskilled workers. Only 10 (6.6%) of participants' mothers and 5 (3.3%) of participants' father were medical professionals. Table 1 shows the sociodemographic characteristics of the participants.

The majority of students 143 (94.1%) had taken the decision to specialize after graduation. However, 8 (5.3%) students were uncertain about the decision to specialize and 1 (0.7%) students did not want to specialize after

**Table 1: Sociodemographic characteristics of the participants**

Age group (years)	Male (n=110), n (%)	Female (n=42), n (%)	Total, n (%)	P
20-24	26 (17.1)	24 (15.8)	50 (32.9)	
25-29	74 (48.7)	16 (10.5)	90 (59.2)	
30-34	8 (5.3)	2 (1.3)	10 (6.6)	
35-40	2 (1.3)	0 (0)	2 (1.3)	
Mean age (years)	26.8±2.9	23.4±2.6		0.03
	<b>n (%)</b>			
Gender				
Male		110 (72.4)		
Female		42 (27.6)		
Marital status				
Single		146 (96.1)		
Married		6 (3.9)		
Religion				
Christians		148 (97.4)		
Muslims		2 (1.3)		
Other religions		2 (1.3)		
Mother's level of education				
Primary		23 (15.1)		
Secondary		32 (21.1)		
Tertiary		96 (63.2)		
No formal education		1 (0.7)		
Mother's occupation				
Unskilled		80 (52.6)		
Skilled		51 (33.6)		
Medical professionals		10 (6.6)		
Other professionals (junior)		3 (2.0)		
Other professionals (middle)		5 (3.3)		
Other professionals (senior)		3 (2.0)		
Father's level of education				
Primary		26 (17.1)		
Secondary		34 (22.4)		
Tertiary		91 (59.9)		
No formal education		1 (0.7)		
Father's occupation				
Unskilled		71 (46.7)		
Skilled		52 (34.2)		
Medical professionals		5 (3.3)		
Other professionals (junior)		7 (4.6)		
Other professionals (middle)		12 (7.9)		
Other professionals (senior)		5 (3.3)		

**Table 2: Timing of decision on specialty of participants**

Time of decision	Frequency, n (%)
Before medical school	5 (3.3)
1 <sup>st</sup> year	14 (9.2)
2 <sup>nd</sup> year	6 (3.9)
3 <sup>rd</sup> year	7 (4.6)
4 <sup>th</sup> year	23 (15.1)
5 <sup>th</sup> year	33 (21.7)
Final year	64 (42.1)
Total	152 (100)

**Table 3: Distribution of specialty of first choice of participants**

Specialty	Frequency, n (%)
Surgery/surgical specialties*	79 (52.0)
Internal medicine	14 (9.2)
Obstetrics/gynaecology	22 (14.5)
Pediatrics	12 (7.9)
Public health	16 (10.5)
Others	9 (5.9)
Total	152 (100)

\*Surgery/surgical specialties - General surgery=30; Neurosurgery=8; Orthopedic surgery=3; Cardiothoracic surgery=7; Plastic surgery=3; Pediatric surgery=8; Urology=7; Radiology=1; Ophthalmology=12. Others - Psychiatry=3; Pathology=3; Clinical pharmacology=2; Family medicine=1

**Table 4: Distribution of specialty of second choice of participants**

Specialty	Frequency, n (%)
Surgery/surgical specialties*	75 (49.3)
Internal medicine	20 (13.2)
Obstetrics/gynaecology	13 (8.6)
Pediatrics	15 (9.9)
Public health	16 (10.5)
Others	13 (8.6)
Total	152 (100)

\*Surgery/surgical specialties - Anaesthesia=3; ENT=2; General surgery=13; Neurosurgery=7; Orthopedic surgery=14; Cardiothoracic surgery=2; Plastic surgery=2; Pediatric surgery=13; Urology=8; Radiology=3; Ophthalmology=8. Others - Psychiatry=4; Pathology=7; Family medicine=2. ENT=Ear, Nose and Throat surgery (aka otorhinolaryngology)

graduation. Five (3.3%) students took the decision to specialize before entering medical school, while majority 64 (42.1%) choose their preferred specialty in final year [Table 2].

Surgical specialties 79 (52%) were the most preferred specialty of the first choice followed by obstetrics and gynaecology 22 (14.5%) as shown in Table 3. Of the surgical specialties, general surgery 30 (19.7%) was the most preferred followed by ophthalmology 12 (7.9%). The male students preferred general surgery 28 (24.5%), whereas ophthalmology was preferred by the female students 5 (11.9%). Pediatrics was the most preferred nonsurgical specialty of the first choice by the female students 10 (23.8%).

Table 4 shows the distribution of specialties of the second choice of the students. Again, surgical specialties 75 (49.3%) were the most preferred followed by internal medicine 20 (13.2%) and public health 16 (10.5%). Of the surgical specialties, orthopedic surgery 14 (9.2%) ranked first while pediatric surgery 13 (8.6%) and general surgery 13 (8.6%) ranked second. All the students who

**Table 5: Distribution of specialties of first choice by age, parent's educational level and occupation of parents specialties**

	Surgery/surgical specialties	Internal medicine	Obstetrics and gynaecology	Pediatrics	Public health	Others	Total, n (%)	$\chi^2$	P
Age group (years)									
<30	71	14	19	12	16	8	140 (92.1)	5.45	0.49
Above 30	8	0	3	0	0	1	12 (7.9)		
Mother's educational level									
None and primary	16	3	2	0	3	0	24 (15.8)	6.30	0.39
Secondary and tertiary	63	11	20	12	13	9	128 (84.2)		
Father's educational level									
None and primary	17	5	3	1	0	1	27 (17.8)	8.66	0.19
Secondary and tertiary	62	9	19	11	16	8	125 (82.2)		
Mother's occupation									
Unskilled	47	6	10	5	8	4	80 (52.6)	3.21	0.62
Skilled	28	5	5	3	6	4	51 (33.6)		
Professionals	4	3	7	4	2	1	21 (13.8)		
Father's occupation									
Unskilled	37	7	11	4	7	5	71 (46.7)	3.10	0.63
Skilled	26	5	8	4	6	3	52 (34.2)		
Professionals	16	2	3	4	3	1	29 (19.1)		
Total, n (%)	79 (52)	14 (9.2)	22 (14.5)	12 (7.9)	16 (10.5)	9 (5.9)	152 (100)		

**Table 6: Gender-wise distribution of factors that influenced first choice specialties mean score of Likert scale in a scale of 5**

Factors influencing specialty choices	Mean±SD		t	P
	Male	Female		
Personal interest	4.5±1.8	4.3±2.0	4.49	0.34
Prestige of specialty	3.3±2.5	2.7±2.2	7.80	0.09
Anticipated income	3.3±1.5	2.6±2.1	6.66	0.15
Good clerkship experience	3.6±2.6	3.3±2.5	2.85	0.58
Personal abilities/competence	4.0±1.9	3.9±2.1	2.60	0.63
Effect of role model	3.4±2.0	2.8±1.7	7.99	0.08
Parental advice	1.8±1.7	1.6±1.2	3.90	0.41
Teachers advice	1.6±1.5	1.9±1.4	4.40	0.30
Friends advice	2.3±1.6	1.5±1.0	5.11	0.27
Family/societal expectations	3.2±1.6	1.8±0.8	9.28	0.03
Career prospects	3.9±2.2	3.5±2.1	5.00	0.30
Shortage of specialist	1.8±1.4	2.4±1.8	7.50	0.12
Less competitive field	1.9±1.6	2.1±1.2	4.60	0.40
Low work h	2.4±1.6	3.5±1.3	9.10	0.04
Short period of training	2.1±1.6	2.3±1.9	2.65	0.64
Research opportunity	3.2±2.1	3.1±2.0	3.00	0.67
Low work-related risks	2.2±1.7	2.1±1.8	3.30	0.56
Diversity of patients	3.2±2.3	2.2±1.7	10.4	0.01
Focus on community health	3.0±1.8	3.1±2.5	2.70	0.70
Physician patient relationship	3.5±2.4	3.4±2.1	3.30	0.50
Total	110	42	152	

SD=Standard deviation

chose orthopedic surgery were males while pediatric surgery was preferred by female students 3 (7.1%).

Significant gender preferences were observed in first choice specialties such as surgical specialties,

obstetrics/gynaecology and pediatrics. Surgical specialties and obstetrics/gynaecology were predominantly chosen by males ( $P < 0.05$ ). Pediatrics was preferentially chosen by female students ( $P = 0.02$ ). There were no significant age-related specialty preferences ( $P = 0.49$ ).

Marital status and religion did not influence specialty choices of participants,  $P = 0.64$  and  $0.86$ , respectively. However, the time of decision of specialty choices was influenced by the year of study of the participants ( $P = 0.001$ ). Majority of the participants took the decision to specialize in either the 5<sup>th</sup> or final year of their study. The educational status and occupation of both parents did not influence the specialty choices of the participants ( $P > 0.05$ ). The distribution of the first choice specialties by age and parents' educational level and occupation is shown in Table 5.

Personal interest was the most common factor responsible for the choice of specialty in 88.8% of students. Other significant factors were personal abilities and competence (76.3%) and career prospects (70.4%). Advice from parents and colleagues/friends was the least common factor responsible for the choice of specialty (11.8%). This was followed by less competitive field and low work related risks (13.8%), and low work hours (15.8%). Table 6 shows the gender-wise distribution of the factors that influenced the specialty of the first choice of students using the mean score of Likert scale. The factors that had the most influence on male students were personal interest ( $4.5 \pm 1.8$ ), personal abilities/competence ( $4.0 \pm 1.9$ ),

career prospects ( $3.9 \pm 2.2$ ), and good clerkship experience ( $3.6 \pm 2.6$ ).

For the female students, personal interest ( $4.3 \pm 2.0$ ), personal abilities/competence ( $3.9 \pm 2.1$ ), career prospects ( $3.5 \pm 2.1$ ) and physician–patient relationship ( $3.4 \pm 2.1$ ) were the most influential factors for specialty preference.

A significant gender difference was noted in the mean scores of family/societal expectation ( $P = 0.03$ ), low work hours ( $P = 0.04$ ) and diversity of patients ( $P = 0.01$ ). The male students' specialty choices were preferentially influenced by family/societal expectations and diversity of patients, whereas low work hours significantly influenced the specialty choices of female students.

## DISCUSSION

The mean age of undergraduates in our study is similar to previous Nigerian studies<sup>[10,12]</sup> but higher than the studies from other countries.<sup>[4,8,9]</sup> This difference may be explained by the fact that the students in our study were in the final year while those in the other studies were recruited from first to final year. The higher proportion of male undergraduates in our study has been widely reported,<sup>[4,8,10,12]</sup> but it differs from reports from Pakistan,<sup>[7]</sup> Kuwait<sup>[9]</sup> and Saudi Arabia<sup>[13]</sup> which had a female predominance. Cultural, religious beliefs and practices may be responsible for this difference. Our study noted that majority of participants' parents had tertiary education and belong to the middle socioeconomic class. Only 6.6% of participants' mothers and 3.3% of their fathers were medical professionals. These findings suggest that the specialty choices of the students were not likely to be influenced by family economic pressures or parental influence.

Our results show that a vast majority of our respondents were definite about the decision to specialize this suggests that our students are certain about their career path and well-motivated about specialization. This is, in contrast, to report from Kuwait and Saudi Arabia where lower rates of the decision were recorded.<sup>[9,14]</sup> We also observed that majority of our participants took the decision to specialize in their final year. This is probably due to exposure to more specialties at the later stage of training. The impact of exposure on the choice of specialty by medical students has been reported by Morrison and Murray at the University of Glasgow.<sup>[15]</sup> They reported that exposure to general practice influenced medical students to choose this specialty for their future medical career. Therefore, studies on the specialty choices of medical students are preferably undertaken in their final year of study when they have been exposed to all the specialties. Furthermore, these choices of specialty might

change as the students' progress in medical school with further exposure to other specialties.

In this study, surgical specialties were the most preferred specialty of the first choice. This is similar to studies from other Nigerian studies<sup>[10,12]</sup> as well as studies from Saudi Arabia<sup>[8]</sup> Jordan,<sup>[4]</sup> Pakistan<sup>[7]</sup> and Canada.<sup>[16]</sup> Obstetrics and gynaecology and public health ranked second and third respectively while the least preferred first choice specialties were family medicine and radiology. Family medicine was also the least preferred specialty in the studies by Khader *et al.*<sup>[4]</sup> and Senf *et al.*<sup>[17]</sup> The duration of undergraduate medical rotation in the various specialties may be responsible for these findings. Whereas our students spend cumulatively between 20 and 24 weeks in the core clinical specialties such as surgery, pediatrics, obstetrics/gynecology and internal medicine, the rotations in ophthalmology, anaesthesia, family medicine and radiology last 3–4 weeks. Increasing the duration of rotation in these specialties might change this pattern.

Regarding the second choice of specialty preferences, surgical specialties, internal medicine, public health were the most preferred. Interestingly, orthopedic surgery was the most preferred second choice surgical specialty. Since orthopedic surgery has a short duration of clinical rotation (3–4 weeks) compared to the other specialties, increasing the duration of its rotation may increase its preference among the students.

Gender differences were noted in the selection of specialty by the medical students. In this study, the majority of the male students preferred surgical specialties and obstetrics and gynecology. The preference of male students for surgical specialties as noted in this study has been reported in similar studies among Pakistani,<sup>[7]</sup> and Norwegian<sup>[18]</sup> medical students. Since the male students are the future breadwinners of their homes, anticipated higher income from surgical specialties may have influenced their choices. Pediatrics was preferentially chosen by female students. This concurs with the reports of previous studies.<sup>[19,20]</sup> The natural love females have for children and their familiarity with child care may explain this pattern of specialty preference.

However, in contrast to our findings, obstetrics/gynaecology was the most preferred specialty by female students in studies conducted in Northern Nigeria,<sup>[12]</sup> Jordan,<sup>[4]</sup> Pakistan,<sup>[7]</sup> and Turkey.<sup>[21]</sup> The majority of the participants (88.8%) studied in Northern Nigeria were Muslims, whereas the reverse was the case in this study. Cultural and religious practices in these societies where women prefer to be attended by fellow women may explain the findings in these studies.

In our cohorts, the most influential factors for specialty choices were personal interest, personal abilities and competence and career prospects. Our findings corroborate earlier reports by Eze *et al.*<sup>[11]</sup> in Enugu Nigeria and Bittaye *et al.*<sup>[22]</sup> in Gambia. In addition to these factors, good clerkship experience and physician–patient relationship ranked fourth among the male and female students, respectively. This suggests that the experience of students during undergraduate medical rotations plays a significant role in their choice of specialty. Therefore the duration and quality of these rotations are important determinants of specialty choices. Interestingly, anticipated income did not feature prominently among the reasons for choice of specialty despite the poor remuneration of doctors in Nigeria. This is in contrast to other studies where economic factors and future income were very important considerations for medical students in selecting a specialty.<sup>[9,23,24]</sup>

The least influential factors in our study were parental advice, teachers' advice and friends' advice. The findings are similar to reports from previous studies<sup>[4,9,11,12]</sup> but in contrast to the study by Mehmood *et al.*<sup>[8]</sup> who reported a significant influence of teachers' and friends' advice on students' choice of specialty. Overall, intrinsic factors seemed to have more influence than extrinsic factors on the choice of specialty among our participants.

The specialty choices of male students were preferentially influenced by family and societal expectation, and diversity of patients. Economic demands on men as the breadwinner of their family and the financial expectations from doctors in our society may be the plausible explanation for this finding. Low work hours significantly influenced the specialty choices of female students. Previous studies show that women preferred specialties which do not have negative impacts on their family and social life.<sup>[20,25,26]</sup> The need to combine the domestic responsibilities of marriage and raising children and professional career demands may be responsible for such choices.

### Limitations of the study

The study was conducted in one medical school, and the relatively small number of participants may make the results not generalizable to other medical schools in Nigeria. The cross-sectional, single-site, and single-assessment design might have limited the scope of the study. Ideally, the students should have been followed up longitudinally to determine the stability of these choices. Self-rating of the factors by the participants is a limitation due to its subjectivity. The influencing factors were limited to 20 variables which might have overlooked the impact of other factors. We recommend further studies which should include more institutions,

longitudinal design with open-ended questionnaire that will help to analyze unidentified factors.

### CONCLUSION

The study shows that majority of medical undergraduates in our cohort make their choice of specialization before graduation. Surgical specialties were the most preferred first and second choice specialties. Surgical specialties and obstetrics/gynecology were mostly preferred by male students while the female students preferred pediatrics and public health. Personal interest in a specialty; personal abilities/competence and career prospects were the most influential determinants of specialty choices. The male students' specialty choices were preferentially influenced by family/societal expectations and diversity of patients while low work hours significantly influenced the specialty choices of female students. These findings should be taken into consideration in career counseling, curriculum development and in measures aimed at provision of comprehensive specialty health care in Nigeria.

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### Conflicts of interest

There are no conflicts of interest.

### REFERENCES

1. Wright B, Scott I, Woloschuk W, Brenneis F, Bradley J. Career choice of new medical students at three Canadian universities: Family medicine versus specialty medicine. *CMAJ* 2004;170:1920-4.
2. Harris MG, Gavel PH, Young JR. Factors influencing the choice of specialty of Australian medical graduates. *Med J Aust* 2005;183:295-300.
3. Dambisya Y. Career intentions of UNITRA medical students and their perceptions about the future. *Educ Health (Abingdon)* 2003;16:286-97.
4. Khader Y, Al-Zoubi D, Amarin Z, Alkafagei A, Khasawneh M, Burgan S, *et al.* Factors affecting medical students in formulating their specialty preferences in Jordan. *BMC Med Educ* 2008;8:32.
5. Soethout MB, Heymans MW, Ten Cate OJ. Career preference and medical students' biographical characteristic and academic achievement. *Med Teach* 2008;30:e15-22.
6. Petrides KV, McManus IC. Mapping medical careers: Questionnaire assessment of career preferences in medical school applicants and final-year students. *BMC Med Educ* 2004;4:18.
7. Hashmi NR, Daud S, Manzoor I, Maqsood S, Aizaz S, Siddiqui D. *et al.* Factors affecting medical specialty preferences and associated gender differences in fourth year MBBS students. *JPMI* 2010;24:101-7.
8. Mehmood SI, Kumar A, Al-Binali A, Borleffs JC. Specialty preferences: Trends and perceptions among Saudi undergraduate medical students. *Med Teach* 2012;34 Suppl 1:S51-60.
9. Al-Fouzan R, Al-Ajlan S, Marwan Y, Al-Saleh M. Factors affecting future specialty choice among medical students in Kuwait. *Med Educ Online* 2012;17:1-7.
10. Onyeka TC, Ewuzie NP. Choice of future career amongst medical

- students in Enugu, Nigeria: Implications for Anaesthesia. *Niger J Surg* 2010;16:9-12.
11. Eze BI, Okoye OI, Maduka-Okafor FC, Aguwa EN. Factors influencing choice of medical specialty of preresidency medical graduates in Southeastern Nigeria. *J Grad Med Educ* 2011;3:367-71.
  12. Oche MO, Raji MO, Kaoje AU, Gana G, Ango JT, Okafoagu N. *et al.* Medical students' specialty preferences: A survey in medical school in Northern Nigeria. *Sci Res Essays* 2013;8:1603-9.
  13. Alshahrani M, Dhafery B, Al Mulhim M, Alkhadra F, Al Bagshi D, Bukhamsin N, *et al.* Factors influencing Saudi medical students and interns' choice of future specialty: A self-administered questionnaire. *Adv Med Educ Pract* 2014;5:397-402.
  14. al-Faris E, Kalantan K, al-Rowais N, al-Mahdi Balla al-Nour M, al-Umran K, Kabraah MT, *et al.* Career choices among Saudi medical students. *Acad Med* 1997;72:65-7.
  15. Morrison JM, Murray TS. Career preferences of medical students: Influence of a new four-week attachment in general practice. *Br J Gen Pract* 1996;46:721-5.
  16. Scott IM, Matejcek AN, Gowans MC, Wright BJ, Brenneis FR. Choosing a career in surgery: Factors that influence Canadian medical students' interest in pursuing a surgical career. *Can J Surg* 2008;51:371-7.
  17. Senf JH, Campos-Outcalt D, Kutob R. Factors related to the choice of family medicine: A reassessment and literature review. *J Am Board Fam Pract* 2003;16:502-12.
  18. Azizzadeh A, McCollum CH, Miller CC 3<sup>rd</sup>, Holliday KM, Shilstone HC, Lucci A Jr., *et al.* Factors influencing career choice among medical students interested in surgery. *Curr Surg* 2003;60:210-3.
  19. Saigal P, Takemura Y, Nishiue T, Fetters MD. Factors considered by medical students when formulating their specialty preferences in Japan: Findings from a qualitative study. *BMC Med Educ* 2007;7:31.
  20. Mwachaka PM, Mbugua ET, Factors influencing choice of paediatrics as a career among medical students at the University of Nairobi Kenya. *SAJCH* 2010;4:70-2.
  21. Dikici MF, Yaris F, Topsever P, Tuncay Muge F, Gurel FS, Cubukcu M, *et al.* Factors affecting choice of specialty among first-year medical students of four universities in different regions of Turkey. *Croat Med J* 2008;49:415-20.
  22. Bittaye M, Odukogbe AT, Nyan O, Jallow B, Omigbodun AO. Medical students' choices of specialty in the Gambia: The need for career counseling. *BMC Med Educ* 2012;12:72.
  23. Morra DJ, Regehr G, Ginsburg S. Medical students, money, and career selection: Students' perception of financial factors and remuneration in family medicine. *Fam Med* 2009;41:105-10.
  24. Corrigan MA, Shields CJ, Redmond HP. Factors influencing surgical career choices and advancement in Ireland and Britain. *World J Surg* 2007;31:1921-9.
  25. Razali SM. Medical school entrance and career plans of Malaysian medical students. *Med Educ* 1996;30:418-23.
  26. Colletti LM, Mulholland MW, Sonnad SS. Perceived obstacles to career success for women in academic surgery. *Arch Surg* 2000;135:972-7.

