

Factors affecting the choice of postgraduate specialty among undergraduate medical students: a prospective observational study from India

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Abstract

Purpose: National policies on the number and distribution of post graduate seats in medical colleges are based on estimated projections of the quantum need of medical work force in the country in future. In order to attract talent, it is imperative to know what factors, modifiable or non modifiable, affect the choice of specialization.

Methods: This is a cross-sectional, observational study. Subjects were undergraduate medical students, at four different phases of their course. They were asked to fill an anonymous feedback form regarding their family and educational background and prospective fields of specialization and placement. Medium of education, interaction with faculty, practices of evaluation and feedback to and from students and use of media in teaching etc were also studied in order to gain an insight into the temporal progression of the thought process of undergraduates.

Results: Majority (88.5%) students wanted to study clinical subjects in post graduation. General Medicine and General Surgery were the most coveted specialties. Passion for the subject, monetary gains and how well the subject was taught were the three main bases for the choice of specialty. Majority of students wanted to serve in government sector after study. Work life balance remained the top priority for more than 78% students in their future lives.

Conclusion: Clinical branches remain preferred over non clinical specialties and research remains a low priority among students. Introducing innovative methods in teaching pre and paraclinical subjects and making medical teaching a more attractive career prospect can help improve this picture.

Key words: Undergraduate, Medical, Education, Priority.

Introduction

National policies on the number and distribution of postgraduate seats in medical colleges are based on estimated projections of the quantum need of medical work force in the country in times to come.

In order to attract the right people for the right job, it is imperative to know what factors, modifiable or non modifiable, affect the choice of specialization. In addition, ways of teaching can also have a great impact on the young minds. The potential to customize the choices of the work force in the country can be efficiently tapped to bridge the gap between demand and supply of medical practitioners and research scholars.

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Studies conducted in the United States (Newton *et al.*, 2005) and China (She *et al.*, 2008) indicate that most undergraduates are inclined towards a career in clinical specialties and research is a priority lower down on scale of aspirations. The basis of selection for most students is monetary returns associated with a particular branch. Most students fluent in English and conversant with the use of computers are unlikely to be undecided in the



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choice of their future careers. However a study from Nigeria (Odusanya *et al.*, 2000) found a different set of basis for choice of specialization. The main reasons influencing specialization were primary interest in the specialty (91%), service to humanity (91%) and job satisfaction (85.7%).

Scarcity of doctors is a well known phenomenon. Paucity of medical colleges to impart quality medical education is often cited as a reason for this problem in addition to issues of brain drain and disdain from joining rural service. More and more efflux of doctors to urban locations results in decreased skilled work force in rural areas and decreased income and level of satisfaction among urban professionals.

Cleland *et al.* (2014) from UK in their study describe how the teaching in medical school in itself alters and shapes career preferences. They however emphasize the need for more longitudinal studies to acquire more robust data in support of this hypothesis.

Thus, we decided to conduct a cross sectional study to understand and analyze the various factors that influence or are associated with the choice of specialization and the priorities which shape this decision, among undergraduate students.

Aim

To study factors associated with the choice of specialization among under graduate medical students in different stages of undergraduate course.

Objectives

1. To estimate the prevalence of various specialties as choices among undergraduate medical students and associated with the preferences over five years of undergraduate study.
2. To study the factors associated with the student's preference towards choice of specialty and placement in later life.
3. To study priorities of young undergraduates in their future plans.

Methods

This cross-sectional, observational study was conducted at a medical college in the national capital. The subjects were undergraduate medical students, at four different phases of their course to analyze their choice of subject of specialization and factors that are associated with it.

Students from the entry year, second year, third year and exit year, representing the outgoing batch were recruited for this study (Figure 1). An anonymous feedback form was prepared after thorough brain storming with preclinical, paraclinical and clinical faculty and also medical education faculty. The feedback form was designed to be a comprehensive document that aimed to gather as much information as was realistically possible about all factors, both direct and indirect, that could have a potential impact on the choice of specialty of a medical undergraduate. The students were asked to fill an anonymous feedback form regarding their family and educational background and prospective fields of specialization and placement.

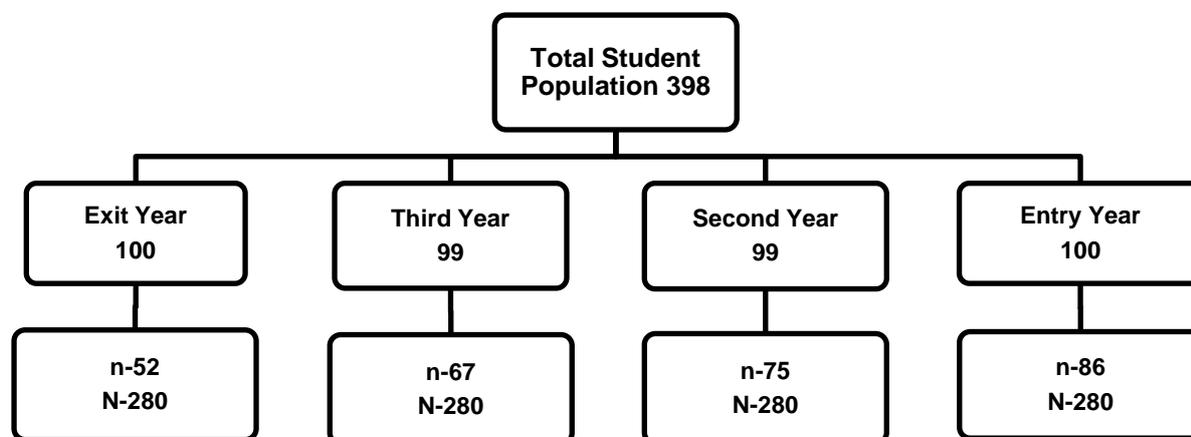


Figure 1: Sample Frame and Sampling

Various aspects of undergraduate teaching such as, medium of education, interaction with faculty, practices of evaluation, feedback to and from students etc were enquired about. Their preferences with respect to language and media for teaching employed in their subjects of preference were also studied in order to gain an insight into the temporal progression of the thought process of young undergraduates.

The data was collected on different days from each of the batches. The feedback form was distributed in a teaching session to the students who were present on the day of data collection. The participation was voluntary and a written consent was obtained from the students who were willing to participate. The data thus obtained was analyzed to answer the study questions. A total of 280 students filled the form. The present study was approved by the Institutional ethical committee of the medical college.

Data analysis

Descriptive and inferential statistics were carried out. Inferential statistics utilized the Chi

square test and Statistical package for social sciences (SPSS) version 20 was used for analysis. A p value<0.05 was considered as statistically significant. Since initially factors which could even remotely bear an influence were included in the feedback form, some of the data for which no meaningful association could be deduced or where sample size was found to be too small to draw a reasonable conclusion were later taken away from the final results.

Results

Of the 280 students who participated in the study, 129 (46.1%) were males and 151 (53.9%) females. Overall, the average age of the study participants was 20.99 years (+2.231) (Table 1). 92.5% students had English as the medium of education in the institute last attended. Overall 85.8% students came from defense backgrounds, and nearly 80% mothers were home makers.

Table 1: Age and Gender distribution of the participants

Year	Mean Age in Years (\pm SD)	Male N (%)	Female N (%)
Entry	19.21(1.228%)	47(54.7%)	39(45.3%)
Second	20.33(1.349%)	37(49.3%)	38(50.7%)
Third	21.28(1.126%)	18(26.9%)	49(73.1%)
Exit	24.5(1.336%)	27(51.9%)	25(48.1%)

More than half the students cleared the entrance exam for entry into medicine course in their second attempt which shows their perseverance towards their chosen profession. 77% respondents had history of multiple attempts at entry.

Passion for the field was the leading cause why people chose medicine accounting for 36% followed by desire to serve society (26%) and to deserve respect from society (18%). A sizeable more than 16% were influenced by their families and only 10% considered monetary gains while they chose this profession.

With the help of our feedback forms, we tried to elucidate the extent of technological proficiency of our students on a cross

sectional basis. The idea was to estimate their efficiency depending on whether they could confidently prepare a word document/a power point presentation/a website. While in the entry level batch, only 65.1% students could create power points with ease, this number sequentially rose to 66.7%, 80.6% and 92.3% through successive batches.

Nearly half of the participants wanted to pursue post graduation and another 50% super specialization. The students aiming at super specialization consistently increased from 46.5% in the junior most batch to 48% in second year, 50.7% in third year and 53.8% in the exit batch. The corresponding figures for graduation only plummeted from 4.7% in the entrant batch to zero in the outgoing batch (Table 2).

Table 2: Year wise distribution of choice of speciality

	Entry Year N (%)	Second year N (%)	Third year N (%)	Exit year N (%)	Overall N (%)
Nonclinical	23(26.7%)	5(6.7%)	1(1.5%)	3(5.8%)	32(11.4%)
Clinical	34(39.5%)	63(84%)	63(94%)	46(88.5%)	206(73.6%)
Not Decided	29(33.7%)	7(9.3%)	3(4.5%)	3(5.8%)	42(15%)
Overall	86(100%)	75(100%)	67(100%)	52(100%)	280(100%)

Specialties were broadly classified into Non-Clinical and Clinical. Non Clinical specialties included Anatomy, Physiology, Biochemistry, Pathology, Pharmacology, Microbiology, Forensic Medicine and Community Medicine. Clinical specialties included Ophthalmology, ENT, Surgery, Medicine, Gynecology and Obstetrics, Paediatrics, Orthopedics, Dermatology, Anesthesia, Radiology and Psychiatry.

As expected, with seniority the proportion of students who had not decided upon their choice of specialization reduced. At the point of entry into a medical college 39.5% students wanted to opt for clinical branches. This figure rose to 88.5% by the time they spent five years in the field and were about to appear for their qualifying exam for entry to post graduation. Correspondingly, the percentage of students keen to take up preclinical subjects dived from 26.7% in the first year to 5.8% in the exit year (Table 3).

Table 3: Year and subject wise distribution of specialty preference

	Entry year N (%)	Second year N (%)	Third year N (%)	Exit year N (%)	Overall N (%)
Anatomy	1(1.2%)	0(0%)	0(0%)	0(0%)	1(0.4%)
Physiology	11(10.8%)	3(4%)	0(0%)	0(05)	14(5%)
Biochemistry	0(0%)	1(1.3%)	1(1.5%)	0(0%)	2(0.7%)
Pharmacology	0(0%)	0(0%)	0(0%)	1(1.9%)	1(0.4%)
Microbiology	2(2.3%)	0(0%)	0(0%)	0(0%)	2(0.75)
Forensic Medicine	4(4.7%)	0(0%)	0(0%)	0(0%)	4(1.4%)
Pathology	4(4.7%)	1(1.3%)	0(0%)	1(1.9%)	6(2.1%)
Medicine	4(4.7%)	22(29.3%)	19(28.4%)	10(19.2%)	55(19.6%)
Surgery	20(23.3%)	16(21.3%)	9(13.4%)	10(19.2%)	55(19.6%)
Dermatology	0(0%)	6(8%)	9(13.4%)	4(7.7%)	19(6.8%)
Obstetrics/Gynecology	1(1.2%)	3(4%)	5(7.5%)	5(9.6%)	14(5%)
Anaesthesia	0(0%)	1(1.3%)	0(0%)	0(0%)	1(0.4%)
Psychiatry	2(2.3%)	3(4%)	3(4.5%)	0(0%)	8(2.9%)
ENT	0(0%)	1(1.3%)	0(0%)	0(0%)	1(0.4%)
Ophthalmology	2(2.3%)	2(2.7%)	2(3%)	1(1.9%)	7(2.5%)
Community Medicine	1(1.2%)	0(0%)	0(0%)	1(1.9%)	2(0.75)
Radiology	3(3.5%)	2(2.7%)	5(7.5%)	2(3.8%)	12(4.3%)
Paediatrics	2(2.3%)	6(8%)	6(9%)	9(17.3%)	23(8.2%)
Orthopaedics	0(0%)	1(1.35)	5(7.5%)	5(9.6%)	11(3.9%)
Not decided	29(33.7%)	7(9.3%)	3(4.5%)	3(5.85)	42(15%)
Overall	86(100%)	75(100%)	67(100%)	52(100%)	280(100%)

It is remarkable that in the entry year, 12% participants were keen on taking up pre clinical subjects, namely, Anatomy and Physiology for specialization which decreased to nil by the end of undergraduate education, as they were exposed to other streams, 9.7% people wanted to opt for paraclinical subjects, namely Microbiology and Forensic science in the initial year of medical studies and this reduced to 3.8% by the end. Dermatology, Psychiatry, Obstetrics and Gynecology, Paediatrics and Orthopedics were branches that consistently showed increasing uptake through the course of medical study. Overall, General Medicine

(19.6%) and General Surgery (19.6%) were most sought after streams followed by Paediatrics (8.2%).

It is their passion for a branch and not money as is popularly believed, that guided the student's choice of specialty in this anonymous study. 68.5% students based their choice on passion for the branch followed by 19.3% who kept the monetary returns in mind while taking this decision. 11.3% responders chose the subject since it was well taught in college (Table 4).

Table 4: Reasons for choice of speciality

Reason	Entry year N (%)	Second year N (%)	Third year N (%)	Exit year N (%)	Overall N (%)
Passion for the subject	43(75.4%)	45(66.2%)	45(70.3%)	30(61.2%)	163(68.5%)
Well paying branch	8(14%)	18(26.5%)	10(15.6%)	12(24.5%)	48(20.2%)
Subject taught well	6(10.5%)	5(7.4%)	9(14.1%)	7(14.3%)	27(11.3%)
Overall	57(100%)	68(100%)	64(100%)	49(100%)	238(100%)

To assess factors associated with choice of specialty, Chi square analysis was carried out. Since 42 students were undecided on the choice of specialty, a study sample of 238 students was used for this analysis. It was observed that preference for clinical

specialties significantly increased with age. 93.9% of students aged more than 21 years chose a clinical specialty as compared to 82.7% students aged 21 or less ($p=0.016$) (Table 5).

Table 5: Results of Chi square analysis for association with choice of speciality

Variables	Criteria	Non-Clinical N (%)	Clinical N (%)	Overall N (%)	p value
Age	21 or less	27(17.3%)	129(82.7%)	156(100%)	0.016
	More than 21	5(6.1%)	77(93.9%)	82(100%)	
	Overall	32(13.4%)	206(86.6%)	238(100%)	
Gender	Male	20(18.2%)	90(81.8%)	110(100%)	0.047
	Female	12(9.4%)	116(90.6%)	128(100%)	
	Overall	32(13.4%)	206(86.8%)	238(100%)	
Year	Entry	23(40.4%)	34(59.6%)	57(100%)	0.000
	Second	5(7.4%)	63(92.6%)	68(100%)	
	Third	1(1.6%)	63(98.4%)	64(100%)	
	Exit	3(6.1%)	46(93.1%)	49(100%)	
	Overall	32(13.4%)	206(86.8%)	238 (100%)	
Reasons for choice of speciality	Passion for the subject	26(16%)	137(84%)	163(100%)	0.107
	Well paying branch	2(4.2%)	46(95.8%)	48(100%)	
	Subject taught well	4(14.8%)	23(85.2%)	27(100%)	
	Overall	32(13.4%)	206(86.6%)	238(100%)	

Gender analysis for choice of specialty revealed that the proportion of female students choosing a clinical specialty was significantly higher (90.6%) than the male students (81.8%) (p=0.047). Among the entry batch students, 59.6% and 40.6% students opted for clinical specialty and non-clinical specialties respectively. This is in contrast to the exit batch students where 93.1% and 6.1% opted for clinical and non-clinical specialties respectively. Thus there is statistically significant difference across the batches (p=0.000).

The question on the biggest influence in their lives was kept anticipating that they would name stalwarts in their field or faculty which could be their basis for choosing a particular specialty. However the question was deliberately kept open ended so as to get a better understanding of who genuinely influenced the young minds to the greatest

extent. The responses were as follows. Parents continued to be the biggest influence (79.6%) in the lives of people who were pursuing higher education and were in general 20 years and above at the time of responding to this study. This was followed by 8.2% for siblings, 6.4% for friends.

When asked about their plans for ultimate placement choices in life, responders made some startling revelations. Contrary to popular perception only 10% students wanted to settle abroad. Almost an equal percentage of students (9.3%) were willing to serve in rural areas as well. As good as 74% (government sector and armed forces combined) intended to not only stay in the country but also serve the government. However, what should incite internal audit is the fact that only 5.4% wanted to become faculty. This reflects our general apathy towards teachers as a society (Table 6).

Table 6: Placement plans

	Entry year N (%)	Second year N (%)	Third year N (%)	Exit year N (%)	Overall N (%)
Government	27(31.4%)	29(38.7%)	32(47.8%)	19(36.5%)	107(38.2%)
Armed Forces	32(37.2%)	24(32%)	25(37.3%)	15(28.8%)	96(34.3%)
Private sector	18(14%)	31(21.3%)	17(16.4%)	21(21.2%)	87(17.9%)
Medical research	24(27.9%)	16(21.3%)	5(7.5%)	3(5.8%)	48(17.9%)
Settle abroad	9(10.5%)	5(6.7%)	9(13.4%)	5(9.6%)	28(10%)
Settle in rural areas	5(5.85%)	8(10.7%)	10(14.9%)	3(5.8%)	26(9.3%)
Teaching	4(4.7%)	4(5.3%)	4(6%)	3(5.8%)	15(5.4%)

It is food for thought that the inclination for medical research, consistently decreased over the years in under graduate education, pegging at 27.9% in the entry batch and getting reduced to less than a quarter of this figure (5.8%) in the exit batch.

We tried to delve a little deeper and understand the long term priorities in the lives of these young, promising doctors. 78% participants chose work life balance as their top priority in life followed almost equally, by money (20.7%) and choice of specialty (20%).

Research and academics came lower down at 11.8% reiterating the earlier observation that fewer people want to join faculty positions. Remarkably, the interest in academics and research is consistently a downward spiral from entry to exit, being 14% in entry year, 13.3% in second, 11.9% in third and only 5.8% in the exit year.

Since the manner in which these young minds are imparted education has an important impact on their choice of branch later, we sought information on how they preferred to be taught. More than 40% students preferred chalk and board teaching and interactive sessions as compared to power point presentations. Even a combination of the two modalities of teaching was not very popular with medical students as only 11.8% participants preferred it. 30.7% respondents did not respond to this question.

The preference for chalk and board teaching only increased with each passing year of undergraduate teaching, doubling from 31.4% in the entry batch to 61.5% in the exit batch. The corresponding rates for audio visual aids were 18.6% in the entry batch, falling to 7.7% in the exit batch (Figure 2). This is surprising bearing in mind that the technological proficiency of these students had consistently risen from entry to exit in the institute.

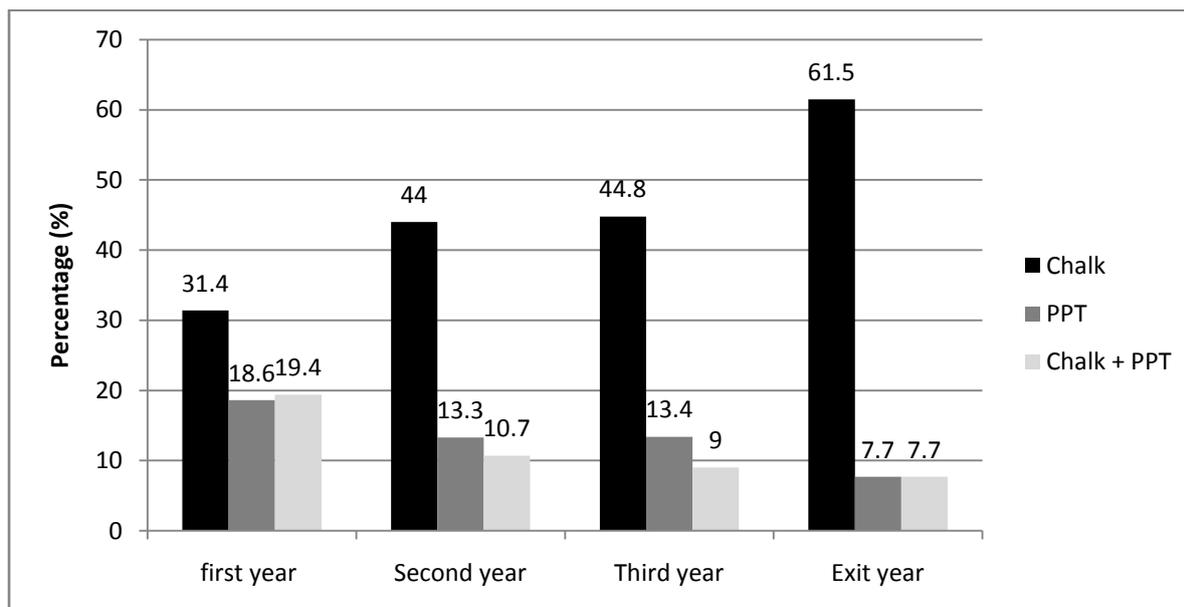


Figure 2: Showing preference of teaching methods by the students

Discussion

In this study on preferences of medical undergraduates, clinical branches clearly scored over diagnostic and preclinical branches. This is similar to the findings of the study from UK conducted across four medical colleges where clinical branches were among the first seven most sought after followed by diagnostics at number eight (Cleland *et al.*, 2014). The phenomenon was consistent among entry and exit level cohorts. In the study from Nigeria as well the top five specialties, namely Obstetrics and Gynecology, Surgery, Paediatrics, Anesthesia and Psychiatry were clinical (Okonta *et al.*, 2015). Reports from Germany have reported similar results (Götz *et al.*, 2011). However, in reports from China, research seemed to be gaining popularity among medical undergraduates (She *et al.*, 2008).

10.8% of our first year students chose Physiology as their preferred subject of specialization followed by 1.2% for Anatomy. The preference for paraclinical subjects in first year was 4.7% each for Pathology and Forensic medicine followed by 2.3% for Microbiology. In a study conducted across five countries comprising first year students the first preference was for Anatomy (Kumar *et al.*, 2014).

Overall, 19.6% each of our participants chose Medicine and Surgery as their preferred choice followed by 8.2% for Paediatrics

followed by 6.8% for Dermatology. In a similar study conducted in Nigeria across four tertiary care teaching centers, the top preferences were for Obstetrics (26.3%), Surgery (21.7%), Paediatrics (11.6%) and Internal Medicine (10.1%) (Okonta *et al.*, 2015).

Similar results were observed in the study from Germany as well where 11.7% students opted for Internal Medicine, 9.77% for Gynecology, 9.62% for Paediatrics and 8.85% for Surgery (Götz *et al.*, 2011). Reports from Malaysia also reported a similar trend (Chew *et al.*, 2011).

In our study, the preference for Gynecology, Paediatrics, Orthopaedics consistently increased from entry level to the exit level batch throughout the course of undergraduate education. This is unlike the findings from Germany where researchers found the preference for Internal Medicine growing exponentially whereas that for surgery reduced (Götz *et al.*, 2011).

More than 58% students opted for their chosen branches because of their keen interest in that subject. This was followed by 16% who chose their respective branches since they were well paying. Nearly 10% students were inclined to their choice of specialty since they had been taught that subject exceptionally well while a small number opted for their branches thinking they were terminal branches and they would not have to pursue super specialty courses in

them. 15% had not made up their mind till the time of study. In the study from Nigeria too, 91% (majority) of students chose their branch of specialization since they had a passion for it (Odusanya *et al.*, 2000). In the study performed across five medical schools in Germany bright career prospects, economic stability and a flare for the subject were cardinal reasons why students chose a specific specialty (Götz *et al.*, 2011). This is similar to findings of our study. In another study from Rajasthan, India too researchers reported interest in the subject, service to community and monetary gains, to be three top factors influencing choice of specialty (Saini & Hasan, 2016). In a report from Gujarat, India, 42% students chose their specialty based on reputation assigned to it (Upadhyaya & Raval, 2015). Only 11% based their choice primarily on monetary rewards.

Gender based analysis of specialty choice in our study revealed that significantly higher number of women students preferred clinical specialty compared to male students. Numerous studies on the subject have reported gender based preferences within clinical specialties (Kumar *et al.*, 2014; Chew *et al.*, 2011; Saini *et al.*, 2016; Bhat *et al.*, 2012). Our study, though remains the first one to compare gender based preferences between clinical and non clinical (pre and paraclinical) specialties.

Students willing for a more full time work were more likely to opt for internal medicine or general surgery as specialty, while those preferring to work part time were more inclined to choose Psychiatry or family medicine as reported by a Dutch study (Akers *et al.*, 2014). Thus, stronger preference for medicine or surgery in our study could possibly be a reflection of willingness for full time work in the students. We however did not study this parameter as an association for the preference of specialty.

In a study from Australia superior patient access, clinical experience and therefore learning opportunity were reasons why students wanted to join rural hospitals. Students Hailing from rural background were eight times more likely to join rural placement opportunities as compared to their urban counterparts. In our study as well 9.3% students were willing to join rural placements. The reason cited most commonly being, hailing from rural background and better clinical exposure (Spencer *et al.*, 2008).

Arcscott-Mills *et al.*, (2016) has reported that 91% undergraduate students after completing their rural posting preferred settling in urban areas. Reasons cited for their preference were professional isolation and stagnation of learning. Hays (2017) has concluded that a longer span of rural posting enhanced the chances of students opting a rural destination for practice. Schofield (2009) has found that 45% of the population studied wanted to practice abroad in the coming five years after medical graduation.

Ten percent students in our study expressed the intent to settle abroad. This is in contrast to studies from Ireland where 38% students by the end of the undergraduate course were keen to move base (Gouda *et al.*, 2015). The reasons cited for the same being standard of training and monetary gains. Deressa and Azazh (2012) from Ethiopia also stated that 53% students willing to move abroad after medical graduation. The inclination towards emigration was higher among senior students as compared to junior students. In a multicentric study published in a recent Bulletin of the WHO, 26% medical students expressed their intent to work abroad within five years of completing graduation. The study population consisted of students from ten institutes from sub Saharan Africa and six from South East Asia. The desire for post graduate speciality training correlated with the aspiration of an international career (Silvestri *et al.*, 2014). This finding does not corroborate with our study where nearly all the students want to pursue post graduation but only 10% are willing to emigrate.

Work life balance (78%), choice of specialty (20.7%) and financial gains (20%) were the top three priorities in the life of young undergraduates in our study. A Swedish study reported that majority of final year students counted work life balance as a top priority and the trend that was emerging was more of "work to live" than "live to work" (Diderichsen *et al.*, 2011).

This study has wide ranging implications in the formation of national policies.

1. Passion for the subject is the paramount reason to choose a specialty.
2. Money does not quite make the world go round in all cases.
3. Enhanced technological proficiency probably is associated with better decision

making prowess and higher aspiration for higher study.

4. Technological proficiency does not parallel interest in research and academics.
5. Research and faculty position appear less rewarding to medical students in the present scenario. There appears to be a need to make these fields more lucrative and impressive in print and electronic media so as to attract more talent in these arenas.
6. All fertile minds are not craving to settle abroad or join lucrative corporate career placements.

Conclusion

Passion for medicine and a desire to serve were the main reasons why students opted for medical career. Majority (88.5%) students wanted to study clinical subjects in post graduation. General Medicine and General Surgery were the most coveted specialties opted for by undergraduate students.

Nearly half of the population studied wanted to pursue post graduation and a similar number aspired to super specialize. Passion for the subject, monetary gains and how well the subject was taught were the three main bases for the choice of specialty. The preference for clinical branches increased consistently with each year of study and women students were significantly more likely to choose a clinical specialty than their male counterparts. Majority of students wanted to serve in government sector after study but only 5% wanted to become faculty or pursue research.

Despite becoming more technology savvy with years of medical training students consistently preferred chalk and board teaching over audio visual aids for teaching purposes. Last but not least, work life balance remained the top priority for more than 78% students in their future lives.

Conflict of Interest

The authors declare no conflicts of interest.

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