Survey on the perception of urology as a specialty by medical students

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Abstract

Introduction: Upon inquiring with medical students and urologists across Canada, it is evident that urology is perceived as a male-dominant specialty, among other stereotypes. These misperceptions may hamper the recruitment of the best and brightest trainees. With that in mind, we surveyed medical students at our institution to obtain an objective assessment of their perception of urology and to determine the cause for misperceptions.

Methods: A 25-factor, validated, anonymous, cross-sectional, self-reported, electronic survey was sent to all medical students at McMaster University to assess their perception of urology. The survey was piloted among students and educational leaders to optimize face and content validity, and minimize measurement bias. Six variables (years in training, role model, a family member or friend in urology, gender, and exposure) were selected a priori and entered into a logistic regression model to determine factors associated with a positive impression of the specialty.

Results: The overall response rate was 70%. Of the respondents, 66% had no exposure to urology and 61% found the amount of exposure to be inadequate. Urology staff and resident involvement in education was considered to be poor by over 30% of medical students. Over 70% perceived urology to be a specialty with a great gender imbalance. On multivariate analysis, exposure to urology was the most important factor ($p<0.001$) associated with students' positive perception of the specialty, in addition to male gender, earlier years in training, and positive role models.

Conclusions: Concerns regarding inadequate urology exposure and poor staff and resident involvement in undergraduate education were seen as potential causes for misperceptions of the specialty. Increasing exposure to urology, encouraging female students, constant effort to approach senior students, and providing mentorship are found to be important factors in establishing a positive perception of urology

Introduction

Choosing a specialty is one of the most important decisions medical students must make. They undergo an extremely complex decision-making process that involves a variety of factors, including medical lifestyle, societal orientation, professional prestige, hospital orientation, scope of practice, and role model.[1] In order to address the causes of unfilled residency positions, there have been numerous studies done in general surgery, family medicine, and internal medicine to determine factors that attract or deter students from these specialties.[1-3]

In addition to previously reported factors identified in other disciplines, students' perceptions of medical specialties have a significant influence in their decision-making process.[3] Urology is a specialty that is perceived to have many stereotypes. It is perceived as a specialty that deals exclusively with the male genitalia, encompasses only male patients, and where there is no role for women. Nevertheless, urology is a specialty that encompasses the entire genitourinary system, thus being relevant to both genders. In addition, this discipline has accepted an increasing number of female urologists over the past 10 years.[4] Medical students' misperceptions towards urology will remain uncorrected unless they seek opportunities to be exposed to it by themselves or have incidental exposures throughout their training.

Although this has been an ongoing and recognized issue within the urology field, there have not been any active efforts to correct these misperceptions. This lack of efforts is perhaps due to the fact that urology has always been a competitive specialty without a challenge to fill residency positions, unlike other fields. However, it is not a matter of recruiting more students into this specialty, but recruiting the best and brightest, as trainees are a critical component for the advancement of the field.

We conducted a pilot survey of medical students aiming to assess their perception of urology as a specialty in order to determine the root causes for misperceptions and to establish ways to correct them.

Methods

Study population

This study was targeted to medical students at McMaster University, assessing their perception of urology as a medical specialty. The study included medical students from all training years and from all three campuses (Hamilton, Kitchener-Waterloo, and Niagara), minimizing selection and sampling bias.

Survey

The survey was approved by the McMaster University Research Ethics Board and consisted of 43 items students usually consider when choosing a specialty, based on previously determined factors as described by other specialties studies.[1-8] These factors cover categories including medical lifestyle, societal orientation, prestige, hospital orientation, scope of practice, and role model. The clarity, comprehensiveness, and appropriateness of the survey questions were verified before commencement of the study by piloting among medical students and educational leaders, optimizing face and content validity.

This 43-item anonymous, cross-sectional, self-reported, electronic survey was distributed from September 23 to November 2, 2012. Non-respondents were followed up with reminder e-mails every two weeks to improve survey completeness.[9]

Statistical analysis

The primary objective of this study was to determine medical students' perception of urology as a specialty. Various factors were explored under categories including medical lifestyle, societal orientation, prestige, hospital orientation, scope of practice, and role model (Table 1). A total of 35 questions were dedicated for this purpose and were analyzed using descriptive statistics. The questions were answered using a seven-point Likert scale. Mean and median were calculated for each question and were compared between respondents who want to pursue urology as a career and those who do not using Mann-Whitney U test. All statistical analyses were conducted with SPSS®, version 22, with statistical significance defined as $p \leq 0.05$.

The secondary objectives were to determine factors associated with a positive impression of the urology specialty and areas we can focus on to improve perception of this specialty. Six variables (age, years in training, role model, a family member or friend in urology, gender, and exposure) were selected a priori and entered into a logistic regression model. We considered $p \leq 0.05$ as statistically significant.

Results

The survey was sent to a total of 567 students, of which, 396 (70%) responded. Demographic characteristics of the participants are shown in Table 2. Of 396 respondents, 76 (19.1%), had considered or were considering urology among all medical specialties. In terms of exposure to urology, 261 (65.9%) participants had no exposure to urology in their training to date. Of the 126 students who had some type of exposure to urology, 72% reported having a positive experience and that lecture (42%) was the most common means of exposure (Tables 3 and 4).

With regards to medical lifestyle, both medical students who were and those who were not considering urology shared similar impression that hours of practice are slightly long (mean 4.66), that there is neutral flexibility outside medicine (mean 4.18), and that both staff and residents are very satisfied with their career (mean score 5.71 and 5.42, respectively). Respondents who were considering urology thought the specialty had higher level of flexibility within medicine than those who were not ($p=0.001$). Medical students who were not considering urology thought overall lifestyle of urology residents was poorer than those who wanted to pursue urology ($p=0.042$)

For social orientation, more than 70% of respondents thought there was a gender imbalance towards males among urologists, residents, and patient population (mean 2.27, 2.54, and 2.56, respectively), and that there was a balanced approachability and intimidation among urologists and residents (mean 4.13 and 4.41, respectively). Other than the gender imbalance, urology patient population was also thought be neutral in diversity and general health status (mean 3.89 and 3.81, respectively) and very satisfied with services provided by urologists (mean 5.56). Those participants who were considering urology thought urologists maintain long-term relationship with patients compared to those who were not considering that specialty ($p=0.002$).

Regarding prestige of urology as a specialty, medical students thought the job stability was slightly above other specialties (mean 4.56) and the income was very good relative to other specialties (mean 5.68). Those students who were considering urology thought urology was very competitive to apply to ($p=0.03$) and a well-respected specialty among colleagues ($p=0.01$) compared to those who were not considering it.

In terms of scope of practice, students who were considering urology thought the specialty has a wider range of practice than those who were not interested in urology ($p=0.01$)

About 21% of the respondents reported having positive role models in urology. As expected, those who were considering urology were exposed to more positive role models in the specialty than those who were not ($p<0.001$). Over 60% of participants thought the amount of exposure during undergraduate medical education was inadequate; in

Table 1. Perception of urology by medical students and univariate analysis between students who were considering urology and who were not considering urology

Factor, mean (SD)	Considering urology	Not considering urology	p value	Total
Lifestyle				
Hours of practice	4.69 (1.28)	4.56 (1.14)	0.282	4.66 (1.25)
Career flexibility in medicine	3.72 (1.27)	4.40 (1.38)	**0.001**	3.89 (1.33)
Career flexibility outside medicine	4.12 (1.32)	4.33 (1.48)	0.391	4.18 (1.36)
Overall lifestyle of urologists	4.82 (1.27)	5.12 (1.12)	0.134	4.89 (1.24)
Satisfaction with career by urologists	5.67 (1.19)	5.83 (1.30)	0.179	5.71 (1.22)
Length of residency	4.63 (0.88)	4.51(0.84)	0.306	4.60 (0.87)
Difficulty level of residency	3.02 (1.06)	3.02 (1.12)	0.838	3.02 (1.07)
Overall lifestyle of residents	3.57 (1.03)	3.92 (1.19)	**0.042**	3.65 (1.08)
Satisfaction with career by residents	5.37 (1.32)	5.58 (1.30)	0.259	5.42 (1.32)
Societal orientation				
Gender balance staff	2.28 (0.61)	2.21 (0.48)	0.322	2.27 (0.58)
Approachableness staff	4.01(1.41)	4.49 (1.67)	0.054	4.13 (1.49)
Gender balance residents	2.53 (0.74)	2.56 (0.94)	0.758	2.54 (0.79)
Approachableness residents	4.29 (1.44)	4.75 (1.56)	0.075	4.41 (1.48)
Long-term relationship with patients	3.83 (0.79)	4.19 (0.79)	**0.002**	3.91 (0.80)
Diversity among patients	3.87 (1.56)	3.97 (1.77)	0.823	3.89 (1.61)
General health status of patients	3.80 (0.92)	3.85 (0.89)	0.666	3.81 (0.91)
Patient satisfaction	5.57 (1.16)	5.54 (1.27)	0.990	5.56 (1.18)
Gender balance patients	2.56 (0.87)	2.56 (0.83)	0.598	2.56 (0.86)
Prestige				
Competitiveness	2.32 (1.24)	1.89 (1.00)	**0.003**	2.22 (1.20)
Prestigiousness	5.06 (1.22)	5.47 (1.17)	**0.011**	5.14 (1.22)
Job stability relative to other specialties	4.50 (1.04)	4.74 (1.02)	0.095	4.56 (1.04)
Income relative to other specialties	5.69 (0.87)	5.68 (1.00)	0.751	5.68 (0.91)
Status/respect among colleagues	4.92 (1.14)	5.42 (0.93)	**0.006**	5.03 (1.11)
Hospital orientation				
Ratio of urgent care to chronic care	3.53 (0.70)	3.65 (0.73)	0.134	3.56 (0.71)
Ratio of in-hospital to out-patient care	3.27 (0.77)	3.27 (0.85)	0.799	3.27 (0.79)
Fastness of effect/outcome of interventions/management	3.35 (0.94)	3.32 (1.06)	0.556	3.34 (0.97)
Scope of practice				
Difficulty of practice	3.22 (0.95)	3.25 (0.98)	0.734	3.23 (0.96)
Range of practice	3.98 (1.45)	4.56 (1.53)	**0.008**	4.12 (1.49)
Balance between clinic and operation	2.75 (0.69)	2.70 (0.76)	0.544	2.74 (0.70)
Significance of research	5.04 (1.28)	5.30 (1.34)	0.108	5.11 (1.30)
Role model				
Positive role models in urology	49 (15.8%)	32 (42.1%)	**<0.001**	
Amount of exposure	2.20 (1.05)	2.68 (1.06)	**0.003**	2.30 (1.07)
Urology staff involvement in education	3.68 (1.56)	4.26 (1.66)	0.114	3.90 (1.61)
Urology resident involvement in education	2.98 (1.44)	4.00 (1.86)	**0.012**	3.41 (1.69)

particular, those who were not considering urology thought it was worse than those who were (p=0.003). They also felt that urology resident and staff involvement in education was poor (p=0.012 and p=0.15, respectively).

As shown in Table 5, exposure to urology field, male gender, positive role model during medical school, and earlier years of training were thought to be factors associated with positive impression of the urology specialty.

Discussion

Choosing a medical specialty involves a complex decision-making process that includes a variety of factors, such as medical lifestyle, societal orientation, professional prestige, hospital orientation, scope of practice, and role model.

The primary objective of the study was to determine how medical students perceive urology as a specialty. We analyzed the survey answers based on whether the respondents were

Table 2. Subject demographic characteristics (n=396)	
Male	146 (35.8%)
Mean age (SD)	24.1 (2.8)
Year of training	
1	162 (39.6%)
2	137 (33.6%)
3	97 (23.8%)

SD: standard deviation.

interested in urology or not. Responses by those who were not interested in urology were considered as how urology is perceived by general body of medical students. Responses by those who were interested in urology were considered as more realistic representation of the specialty, as these students likely had in-depth exploration of the specialty before deciding to pursue it as their career. Based on the analysis, there were both accurate and not-so-accurate perceptions, some of which will be highlighted in this discussion.

The majority of survey participants (>70%) thought there was a significant male preponderance among urology patients, staff, and residents. This perception accurately represents the current gender imbalance in urology and it likely discourages female students from considering urology as a career. This was reflected in the 2012 Canadian residency match results. There were 28 male applicants to urology as their first choice, as opposed to only seven females. Urology had the second greatest gender discrepancy, with a male-to-female applicant ratio of 4:1, when compared to 3:1 ratio in cardiac surgery; 1.2:1 in general surgery; 2.3:1 in neurosurgery; 1.7:1 in ophthalmology; 2.5:1 in orthopedic surgery; 1.1:1 in otolaryngology; and 1.5:1 in plastic surgery. The only other surgical specialty with a greater magnitude of gender discrepancy was obstetrics and gynecology, except the gender discrepancy was in the opposite direction with male-to-female applicant ratio of 1:7.6.[10] In urology, the male-to-female ratio of 4:1 in trainees had been roughly consistent since 1995, as per the Canadian Post-MD Education Registry (CAPER).[11] Interestingly, the discrepancy was less preponderant in the U.S., as the male-to-female ratio was 2.9:1 among matched applicants.[12]

Table 3. Interest in and exposure to urology (n=396)			
	Yes	No	Total
Considered urology	76 (18.6%)	314 (77%)	390
Family member/friend/ colleague who is urologist/urology resident/ interested in urology	92 (22.5%)	295 (72.3%)	387
Exposed to this specialty?	126 (32.6%)	261 (67.4%)	387
Lecture			53 (42.0%)
Observership			28/126 (22.2%)
Elective			22 (17.5%)
Clerkship rotation			20 (15.9%)
Conference			3 (2.4%)

Table 4. Experience after exposure to urology	
Positive	85 (72.0%)
Negative	2 (1.7%)
Neutral	30 (25.4%)
Other	1 (0.8%)

We learned that urology is perceived as a prestigious, satisfying, and good income profession by most responders; however, near 70% of the participants considered it to be a competitive specialty to pursue. It is debatable whether this is an accurate perception or not. When one looks at the 2012 statistics, of 48 applicants, only 35 considered urology as their first choice of discipline to 33 available spots.[10] When competitiveness is calculated using the number of applicants with first choice of discipline and the total number of available spots, urology is comparable to many other surgical specialties (Table 6). Melnyk et al also reported that the competitiveness was 2.0 in 2002, which decreased to 1.35 in 2011.[13] The competitiveness in 2012 showed further decrease to 1.1.

The general body of medical students perceived urology as a specialty with poorer lifestyle, less long-term relationship with patients, and narrower range of practice than the specialty might actually be. In other words, once medical students had exposure to the specialty and explored it in-depth with interest, they realized that the specialty has a better lifestyle, more long-term relationship with patients, and wider range of practice than they perceived.

In any situation in life, it is a privilege to have a role model to look up to, to learn from and be motivated by. By the same token, being a role model and to advise and nurture someone's potential should be perceived as a privilege. There should be a bidirectional effort to form a good, successful mentorship, with mentor actively partaking in education and mentee willing to learn. From medical students' perspective, both urologists and urology residents were thought to have poor involvement in education. Over

Table 5. Multivariate logistic regression analysis of factors associated with positive perception of urology		
Factor	n	p value
Age (SD)	24.1 (2.8)	0.116
Exposure (%)	126 (32.6)	0.001
Family or friends (%)	92 (22.5)	0.783
Gender (male, %)	146 (35.8)	0.004
Year 1 (%)	157 (39.5)	0.017
Year 2 (%)	135 (33.6)	0.064
Year 3 (%)	95 (23.8)	0.054
Role model (%)	81 (20.9)	0.021

SD: standard deviation.

Table 6. Competitiveness of surgical specialties in Canada in 2012

Specialty	Total number of applicants	Total number of applicants with first choice	Total number of available spots	Competitiveness
Cardiac surgery	9	4	9	0.4
General surgery	209	112	100	1.1
Neurosurgery	30	19	23	0.83
Ophthalmology	77	62	39	1.6
Orthopedic surgery	117	83	76	1.1
Otolaryngology	56	41	31	1.3
Plastic surgery	70	45	26	1.7
Urology	48	35	33	1.1
Vascular surgery	28	15	8	1.9

60% of the responders thought that their exposure to urology was inadequate throughout medical school. Regardless of whether the perception of poor involvement in education is due to lack of exposure or the lack of exposure is due to poor involvement in education, this should be a wake-up call for educational leaders in urology to initiate change.

In addition to the above survey findings, another important observation was that a significant portion of the students did not know how to answer some of the questions. Each question was designed with an option of "I do not know" for those who have minimal awareness of urology. The rate of "I do not know" response ranged from 9–48%. On average, the students did not know answers to the questions 33% of the time, suggesting lack of awareness of the specialty among medical students and once again calling for more active involvement for urology residency programs in undergraduate education.

We identified the following factors associated with positive impression of urology as a specialty in our multivariable analysis: prior exposure to the field, presence of role models throughout medical school, being a male student, and earlier years in training. Overall, less than 33% of the respondents had exposure to urology in their medical education training, over 60% thought the exposure was inadequate, and the majority thought staff and resident involvement in education were poor. As this survey was a reflection of McMaster medical students whose curriculum does not have urology as a mandatory clerkship rotation, the perception may be different in medical schools where urology is part of the mandatory curriculum; however, the reality is that there are no Canadian medical schools that have a mandatory rotation in urology. Although the results were dismal, the fact that 70% of students who had exposure to urology had a positive experience is encouraging. Therefore, increasing lecture time, promoting observership opportunities, and incorporating urology as part of the clerkship rotation are examples of ways to improve exposure for medical students.

Along with the effort to increase exposure, it should be kept in mind that having a role model was also shown to be associated with a positive impression of urology. Being a role model should not only involve attracting new students to pursue this career, but also being proactive in the education and nurturing of a student's potential; this will eventually result in more awareness and improved perception of urology among students who may be having their first interaction with urological conditions.

Being male and being in the earlier years of training were also shown to be associated with positive impressions of urology, which means that students lose their interest in urology as they go through their training. We should try to approach all students, but we could give closer attention to female and senior medical students to improve perception of urology more effectively.

This was the first survey to explore perception of urology as a specialty and factors that influence the perception. The survey generated an excellent response rate of 70%, which makes the findings more generalizable to non-participants, with minimal response bias. As the survey population was inclusive of all years of training and all regional campuses, respondents represented a more heterogeneous group.

The main limitation of this study is the fact that it was conducted at a single institution, so although it may be generalizable for educators and students at McMaster University and other medical schools with similar curriculum, it may not be generalizable nationwide.

Conclusion

Canadian medical students at McMaster University perceived urology as a specialty with a high level of satisfaction, prestige, and a good source of income. Students also recognized that this specialty has a great gender imbalance and is competitive. Concerns regarding inadequate exposure to urology and poor staff and resident involvement in undergraduate education were identified as potential causes for misperception of the specialty. Increasing exposure to the urology field, providing proper mentorship, encouraging more female students to be involved, and approaching senior students are found to be important factors in establishing a positive perception of urology as a specialty.

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This paper has been peer-reviewed.

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