PAPER

Women in Surgery

Do We Really Understand the Deterrents?

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Hypothesis: Women are deterred from a surgical career owing to a lack of role models rather than lifestyle considerations.

Design: Survey.

Setting: University teaching hospital.

Participants: Surgery and obstetrics/gynecology attending physicians, residents, and medical students.

Intervention: Questionnaire.

Main Outcome Measures: Potential deterrents to a surgical career.

Results: Men and women had a similar interest in a surgical career before their surgical rotation (64% vs 53%, $P=.68$). A similar percentage developed a mentor (40.0% vs 45.9%, $P=.40$). Women were far more likely to perceive sex discrimination (46.7% vs 20.4%, $P=.002$), most often from male attending physicians (33.3%) or residents (31.1%). Women were less likely to be deterred by diminishing rewards (4.4% vs 21.6%, $P=.003$) or workload considerations (28.9% vs 49.0%, $P=.02$). They were also less likely to cite family concerns as a deterrent (47.8% vs 66.7%, $P=.02$) and equally likely to be deterred by lifestyle during residency (83.3% vs 76.5%, $P=.22$). However, women were more likely to be deterred by perceptions of the "surgical personality" (40.0% vs 21.6%, $P=.03$) and the perception of surgery as an "old boys' club" (22.2% vs 3.9%, $P=.002$).

Conclusions: Men and women are very similar in what they consider important in deciding on a surgical career. Women are not more likely to be deterred by lifestyle, workload issues, or lack of role models. However, the perceived surgical personality and surgical culture is a sex-specific deterrence to a career in surgery for women.

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OVER THE PAST DECADE, US medical schools have increased their emphasis on primary care based on projected needs in the physician workforce. However, recent analyses have suggested that these projections were erroneous, and there will actually be an increased need for general surgeons.[1] It is unclear how this need will be met in light of the steady decrease in the percentage of medical students who are entering general surgery residency[2] and the waning interest in a surgical career among medical students.[3,4] Further, approximately half of entering medical students are women, who have traditionally been less inclined toward a surgical career.[5] These factors create substantial challenges to surgical educators.[6]

It has become clear that the reasons why relatively few women enter a career in general surgery may be more complex than often assumed. The goal of this study was to investigate deterrents to a surgical career that might be relatively unique to women. The primary hypothesis was that women are deterred from a career in surgery owing to a lack of role models rather than lifestyle considerations.

METHODS

A survey was distributed via email to attending and resident physicians in surgery and obstetrics/gynecology at Fletcher Allen Health Care, the teaching hospital of the University of Vermont College of Medicine during the spring of 2004. At that time, the Department of Surgery was beginning the transition to the 80-hour resident workweek. The surveys were also distributed to third- and fourth-year medical students at the College of Medicine. The surveys were essentially the same for all 3 groups with the exception of a few unique demographic questions that were based on level of training. Completed surveys were returned to the principal investigator.

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Table 1. Demographics of Respondents

Respondent	Sex: Male	Sex: Female	Total
Attending physician, No.	18	13	**31**
Within sample population, %	58.1	41.9	100
Within sex, %	35.3	14.4	22.0
Residents, No.	8	8	**16**
Within sample population, %	50.0	50.0	100
Within sex, %	15.7	8.9	11.3
Students, No.	25	69	**94**
Within sample population, %	26.6	73.4	100
Within sex, %	49.0	76.7	66.7
Total, No.	51	90	**141**
Within sample population, %	36.2	63.8	100
Within sex, %	100	100	100

Table 2. Deterrents to a Career in Surgery

Deterrent	Women, No. (%) (n = 90)	Men, No. (%) (n = 51)	*P* Value
Diminishing rewards	4 (4.4)	11 (21.6)	.003
Increased number of lawsuits	8 (8.9)	7 (13.7)	.27
Lifestyle (during residency)	75 (83.3)	39 (76.5)	.22
Family concerns	43 (47.8)	34 (66.7)	.02
Reimbursements	2 (2.2)	4 (7.8)	.12
Workload	26 (28.9)	25 (49.0)	.02
Level of stress	22 (24.4)	13 (25.5)	.52
Lack of role models/mentors	11 (12.2)	3 (5.9)	.18
Surgeons' perceived personalities	36 (40.0)	11 (21.6)	.03
Perception of surgery as an "old boys' club"	20 (22.2)	2 (3.9)	.002
Lack of women in surgery	5 (5.6)	0	.10

All data were imported into an SPSS Windows Version 12 spreadsheet program (SPSS Inc, Chicago, Ill) for the purpose of generating frequency tables. These frequency tables were cross-tabulated by sex. Comparative analysis was performed on all questions from the survey considered relevant to the hypothesis being tested. For questions requiring a categorical response, a χ^2 test was applied to assess for differences between sexes. Questions requiring a response of degree or ordinal response were compared using a Mann-Whitney test.

RESULTS

A total of 298 surveys were sent out. Sixty-eight were sent to attending physicians, 31 to resident physicians, and 199 to medical students. The response rates for attending physicians, resident physicians, and medical students were 46%, 52%, and 47%, respectively. The demographics of the respondents are exhibited in **Table 1**. Of the attending physicians who completed the survey, 16 were general surgeons and 15 were obstetrician/gynecologists.

Several questions were directed only to the medical students. Sixteen percent of male students considered general surgery their number 1 career choice prior to medical school vs 7.4% of women ($P=.37$). A similar percentage enjoyed their third-year clinical rotation in surgery (84.0% of men vs 81.1% of women, $P=.90$). For those men who developed a mentor, 60% reported having a male mentor whereas 40% had both male and female mentors. None had only a female mentor. On the other hand, 24.3% of women developed only female mentors, 29% developed only male mentors, and 45.9% developed mentors of both sexes. Regarding discrimination, 46.7% of women perceived sex discrimination vs 20.4% of men ($P=.002$), most often from male attending physicians (33.3%) or male residents (31.1%).

All participants were asked to select their top 3 deterrents to a career in surgery (**Table 2**). "Diminishing rewards" was the choice of 21.6% of male respondents vs 4.4% of female respondents ($P=.002$). "Lifestyle during residency" was chosen as a deterrent by 83.3% of women and 76.5% of male respondents ($P=.22$). Notably, only 47.8% of women vs 66.7% of men selected "family concerns" as a major deterrent ($P=.03$). "Workload" was also a statistically greater deterrent for men than women (49.0 vs 28.9%, respectively; $P=.02$). Only 12.2% of women and 5.9% of men felt that a lack of identifiable role models was a major deterrent to a surgical career ($P=.18$).

Women were more likely to be deterred by their perceptions of the surgical personality (40.0% vs 21.6%, $P=.03$) and the perception of surgery as an "old boys' club" (22.2% vs 3.9%, $P=.002$). Regarding mentoring, 35.3% of men vs 21.6% of women felt that a mentor was very influential in their career choice ($P=.05$). Only 16% of women felt that they would be more likely to choose a career in general surgery if there were more women in leadership positions, and only 5.6% were deterred by a relative lack of women in surgery. Prior to their clinical clerkships, 57.3% of women had had no interactions with surgeons vs 36.7% of men ($P=.04$).

Respondents were also asked to choose the 3 most important factors related to their choice of specialty. Lifestyle was chosen by 42.2% of women vs 29.4% of the male respondents ($P=.09$). Research opportunities appealed more to male respondents (19.6% vs 4.4%, $P=.004$). A key factor for 22.2% of women and 21.6% of men was plans to marry and raise a family.

COMMENT

Our results strongly suggest that men and women are deterred from a career in surgery for substantially the same reason: lifestyle. More than three quarters of students of both sexes cited lifestyle during residency as the prime deterrent with family concerns a close second. The critical importance of lifestyle issues in the selection of specialty has been consistently highlighted by other investigators.[6-10]

However, lifestyle is clearly not just a "women's issue."[11] In fact, women were statistically less likely to cite family concerns or be deterred by the surgical workload. Further, women were almost 5 times less likely to be concerned about the prospects of diminishing rewards. As such, a reasonable argument can be made that efforts to attract women to a career in surgery should be at least as productive as with men.

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However, our results also suggest that there exists a male culture in surgery that needs to be confronted because it is a significant factor deterring women from a career in surgery. Almost half of the women in our sample perceived sex discrimination in surgery, as others have also reported.[12] Further, the "surgical personality" and perception of surgery as an "old boys' network" were important sex-specific deterrents to a surgical career among women. Surgery remains a "macho field."[13]

We were surprised that only 5.6% of women were deterred by a lack of women in surgery and relatively few were concerned about the lack of women in leadership positions. Although having role models is clearly an important factor in women's choosing a surgical career,[12,14,15] the role models may not need to be other women. Of those women who considered a role model influential in their career choice, approximately 75% had a male role model.

The importance of role models for both sexes has been highlighted by a number of investigators.[16-19] Although concerns about the relative paucity of women in surgery[16] and leadership positions may be well founded,[20,21] it may be more important for surgeons to model behavior that is more welcoming to women irrespective of their sex.

A careful reappraisal of student interactions with surgeons would seem to be helpful in attracting medical students to a career in surgery. More than 80% of students of both sexes enjoyed their surgical rotation; many identified with a role model or mentor. But surgeons need to address lifestyle issues; dedication, commitment, and professionalism are not necessarily incompatible with a reasonable lifestyle. Perhaps the 80-hour resident work restriction will ease some of our students' concerns.

In conclusion, both men and women are deterred from a career in surgery primarily by lifestyle considerations. However, the surgical culture and personality are sex-specific deterrents to women. Surgeons need to critically assess the nature of their interactions with students and provide an environment more conducive to women.

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DISCUSSION

Orlando Kirton, MD, Hartford, Conn: I thank you for this paper. I think we need to hear more manuscripts and publications of this sort, particularly as our workforce changes and becomes more diverse to reflect the diversity of our ever-diversifying population.

One of my questions is, would you consider a regional survey because I think it would be useful to move this line of questioning beyond just an institution to a multi-institutional perspective of the barriers to further diversification of our workforce? It is interesting: at Hartford Hospital and the University of Connecticut School of Medicine where I'm at, 40% of our first-, second-, and third-year categorical resident class are women, and if we look at our second- and third-year class, it's actually 70% of our categorical residents [who] are women in those 2 years. Currently this year, we have 2 women residents who are pregnant and over the last 2 years, we've had 4 women in our residency, categoricals, who have had children, so things are changing, I think, definitely for the better.

Do you think your results would have been different if the survey was administered 5 years ago before the 80-hour work week mandate was put in place by the ACGME? Thank you.

Dr Gargiulo: Thank you for your comments, sir, and for your question. I think that probably my results would have been very similar. I'm finding, at least from looking at the research that was projected from this report, that workload and number of hours weren't directly addressed by my respondents. They didn't really make much mention of 80 hours vs 110 or 120 hours. There is a huge difference there, I recognize, but I think the determinants are more fundamental than the actual practice of surgery as a resident or as an attending.

Atul Gawande, MD, Boston, Mass: Terrific topic, and you're being very creative about how to answer these important questions about bias and discrimination.

Dr Gargiulo: Thank you, sir.

Dr Gawande: One question, though, is whether your methods can actually measure and discriminate among the differ-

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ent kinds of explanations that you are talking about. How did you develop the specific questions for your survey, and did you do any testing of the validity and reliability of the questions?

Dr Gargiulo: What I did was I read as many papers as I could that were out there that even remotely touched upon this topic just to see what other people wrote in order to generate ideas on what might be important to ask, and then I set to the task of setting up the survey. The survey went through several revisions over several months before I sent it out via e-mail, and your point is a good one. I did give my survey out to a handful of people to take in order to pick out vagueness in questions and to try to fine-tune it a little bit more, but if I was to do this again, I think that in terms of putting together an even more powerful tool for distribution, I would look to distribute it out to a broader base of people in order to really make sure that I saw any and all loopholes that could be misinterpreted and so forth.

Jennifer Tseng, MD, Worcester, Mass: I think this is a very important area of research. My question is, have we really proven that there are deterrents to women going into surgery as opposed to staying in? I know it's a provocative question, but certainly at the program where I am now, which is the University of Massachusetts in Worcester, the majority of interns (6 out of 7 categoricals) are women, and at the program where I train, the Massachusetts General Hospital, the majority of categorical interns are also women. So I would suggest that women are actually going into surgery. The people that you looked at were medical students that may or may not have any interest in surgery to begin with and then residents and attendings who either chose surgery or didn't, so my question is have we really answered the fact that there are deterrents before we even start to study exactly what those deterrents are?

Dr Gargiulo: Well, I experienced a very similar situation to yourself. I'm an intern at Baystate Medical Center, where 5 out of the 6 incoming intern class are female. I do stand behind the fact that I think there are deterrents. When I interviewed people, when I spoke with people, and granted as I mentioned earlier, UVM is a small pool of people, but there are still a lot of feelings that surgery was a fun thing to do. One of my questions which really didn't pertain to the meat and potatoes, if you will, of what I wanted to get across today, so I didn't add it into the slides, but one of the questions asked whether or not you enjoyed your rotation as a third-year medical student in surgery, and 85% of my respondents, 85% of the female and about 80%, I believe, of the men, loved it, and yet the number who actually go into it when all is said and done doesn't come anywhere near that.

Patricia Donahoe, MD, Boston: I'd like to make a few historical observations. One is that the deterrents for women going into surgery have incredibly changed over the years from the early time when women surgeons were overtly ignored in the hopes that they would "go away." As the only woman in a sea of male faces at the American College, I was assumed to be either from a support staff of the college or someone's secretary. Women are now welcomed, even sought after. The 80-hour work week will make an enormous difference in allowing women to be all that they wish to be—excellent surgeons, mothers, and spouses. However, the next issue must be to remove the residual glass ceiling for women. Organizations such as the New England Surgical Society can be pacesetters by making many women committee chairs, session moderators, officers.

Thomas Vander Salm, MD, Salem, Mass: I enjoyed your talk. You referred to the surgical personality and as I look around the room, I see variety, from ex-Navy fighter pilots to those considerably less bold, and I wonder how you define surgical personality.

Dr Gargiulo: It's interesting you bring that up, sir, because I chose not to. I left it up to the imagination, if you will, of my respondents. With that said, however, when I got back my surveys via email I downloaded them and printed out the copies in order to then obviously put my data into the spreadsheet, and people editorialized to me in no uncertain terms what they thought the personality of surgeons was. So I hope I am answering your question directly. I did not define it. I allowed people to make of that what they would based on their own personal experience with surgeons or what they've heard in terms of old wives' tales or what have you.

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