Choosing a Specialty in Medicine: Female Medical Students and Radiology

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OBJECTIVE. The purpose of this study was to determine whether there are identifiable factors that dissuade female medical students from entering the field of radiology.

MATERIALS AND METHODS. An anonymous survey was completed by medical students at the end of their third- or fourth-year radiology clinical clerkships at five institutions. In addition to demographic data and residency choice, respondents ranked 10 factors in order of importance to their choice of career. For respondents who did not consider radiology a possible career, a second set of eight factors was ranked for importance in dissuading them.

RESULTS. Two hundred eighty-eight respondents completed the survey, 152 (53%) men and 136 (47%) women. Both men and women reported direct patient contact and intellectual stimulation as the most important factors in deciding on a specialty. For those who chose radiology, intellectual stimulation and use of emerging technology were significantly ($p < 0.05$) more important than other factors. The factor that most strongly (96%) dissuaded men and women from a career in radiology was lack of direct patient contact. There was no significant difference between men and women in ranking factors that dissuaded them from applying to radiology residencies; however, nearly one third of the female respondents cited competitiveness of the residency process as important.

CONCLUSION. Patient contact remains an important factor for medical students choosing a career. To attract high-caliber students, medical schools should expose students to areas of radiology involving patient interaction. Academically qualified women should be identified early during their careers and encouraged to apply for radiology residencies.

Keywords: education, radiology education, radiology practice

DOI:10.2214/AJR.06.0539

Received April 19, 2006; accepted after revision September 12, 2006.

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AJR 2007; 188:897–900

0361–803X/07/1884–897

The number of women choosing diagnostic radiology as a career has been declining. In 1995, 14% of all practicing radiologists in the United States were women and 28% of radiology residents were women [1]. In 2000, the percentage of practicing radiologists who were women increased slightly to 16%, but the percentage of radiology residents who were women declined to 22% [2]. During this same period, the number of female medical students increased to the extent that women made up approximately one half of every medical school class [3]. Because the often stable work hours of radiology in comparison with other medical disciplines would seem likely to appeal to women, the decrease in the number of female applicants is difficult to explain. The goal of our project was to define the factors most important to medical students in choosing or rejecting a career and to analyze these data to determine why women are not choosing radiology.

Materials and Methods

After discussions with colleagues and medical students at one institution, we developed a questionnaire designed to determine the social factors most important to medical students choosing a career. To capture the largest number of students interested in radiology, the survey was administered to third- and fourth-year students at the completion of their medical school radiology clerkships at five medical schools. Because the survey was anonymous and optional and had no connection to final grading, the study was exempt from institutional review board approval at the participating institutions. Four of the medical schools offered radiology as an elective clinical rotation, and one required participation by all students.

After providing demographic data such as sex, race, and age, all students were asked to rank 10 factors important in choosing a medical specialty. These 10 factors were salary, work hours, job flexibility, intellectual stimulation, use of emerging technology, contact with patients and effect on their lives, perception of specialty by mentors and col-

TABLE 1: Demographic Data on 288 Medical Students Responding to Career Choice Survey (mean age, 27 years; age range 22–50 years)

Demographic Factor	No.	%
Year in school[a]		
Third	81	28
Fourth	206	72
Sex		
Male	152	53
Female	136	47
Significant other[a]		
Yes	175	61
No	110	39
Children[a]		
Yes	30	11
No	257	89
Race		
White	194	67
African American	23	8
Asian	48	17
Latino	14	5
Other	9	3

[a]Numbers do not total 288 because some respondents did not provide data on year in school, significant other, and children.

leagues, perceived job satisfaction among those in the specialty, job opportunities available, and competitiveness of the residency selection process. Respondents were then asked whether they had chosen a residency specialty and, if so, the field.

All students were asked whether they would consider radiology as a career. The students who responded that they would not were asked to complete a second portion of the survey, ranking eight factors that dissuaded them from considering radiology, again in order of importance to them. These factors were requirement of physics and technical expertise, role as a consultant to other physicians, lack of direct patient contact, potential exposure to radiation, negative perception of radiology by mentors and colleagues, perceived lack of job satisfaction among radiologists, perceived lack of job flexibility, and competitiveness of obtaining a residency in radiology.

A factor was considered important to a respondent when it was ranked as one of the three most important factors. In this way variables were characterized as either important or not important, yielding dichotomous data. In many cases, students did not rank all variables. Blanks were considered not important to the respondent. For each factor, the number of medical students classifying it as important and the corresponding percentages were determined for descriptive purposes for men and women among students choosing radiology as a specialty and those not choosing radiology as a specialty. Comparisons between the two groups were made for each factor with Mantel-Haenszel tests adjusted for sex. Comparisons were then made between the two sexes for each factor, again with Mantel-Haenszel tests, this time adjusted for whether radiology was the chosen specialty.

Results

Four hundred sixteen students were given the survey, and 288 completed it, yielding a response rate of 69%. One hundred thirteen students in this group were participating in a required radiology clinical clerkship, and the others had chosen the clerkship as an elective rotation. One hundred fifty-two of the respondents were men (53%) and 136 were women (47%). Of this group, 230 (80%) of the students had chosen a specialty, and 58 (20%) had not. This distribution corresponded closely to that of the fourth-year ($n = 206$) and third-year ($n = 81$) students. One student did not provide year in medical school. The average age of a respondent was 27 years with a range of 22–50 years. Complete demographic data are reported in Table 1. Across the five medical schools, the percentage of medical students who were women ranged from 49% to 51%.

For students who had chosen a medical specialty, the most common specialties were internal medicine ($n = 42$, 18%), radiology ($n = 35$, 15%), and family practice ($n = 24$, 10%). The other commonly chosen specialties are listed in Table 2. Factors considered most important in career choice were the same for men and women. In order of importance, these factors were direct patient contact, intellectual stimulation, and perceived job satisfaction of physicians in the specialty (Table 3). For both men and women who had chosen radiology as a career, intellectual stimulation ($p = 0.004$) and use of emerging technology ($p = 0.0001$) were more important than they were for the group who had not chosen radiology as a career. Women who had chosen a radiology career put less importance on salary ($p = 0.005$) and more importance on direct patient contact ($p = 0.02$) than did men who had chosen radiology.

For those who had not considered radiology as a career ($n = 169$), lack of patient contact was the most important factor ($p = 0.0001$) followed by role as a consultant rather than primary care physician. For women, the third most important factor was competitiveness of the residency selection process, whereas for men it was the physics requirement. These results are reported in Table 4. The only significant difference identified between men and women who had not considered radiology as a career was that men considered job flexibility more important ($p = 0.01$). Men also tended to consider a role as a consulting physician more negatively ($p = 0.05$).

TABLE 2: Specialty Training Chosen by 230 Medical Students

Specialty	No. of Students	%
Internal medicine	42	18
Radiology	35	15
Family practice	24	10
General surgery	22	10
Pediatrics	19	8
Emergency medicine	17	7
Anesthesiology	15	7
Orthopedic surgery	7	3
Ophthalmology	6	3
Obstetrics and gynecology	6	3
Medicine, pediatrics	4	2
Neurosurgery	4	2
Dermatology	4	2
Radiation oncology	4	2
Rehabilitation medicine	4	2
Otolaryngology	3	1
Urology	3	1
Pathology	3	1
Psychiatry	2	< 1
Neurology	2	< 1
Research	1	< 1
Combined residency	1	< 1
Not specified	1	< 1

Note—Numbers do not total 230 because one respondent did not complete this item.

Discussion

Our survey results show that medical students consider direct patient contact and intellectual stimulation the most important factors in deciding on a career. For both men and women, a perceived lack of patient contact and role as consultant physician were cited as the most undesirable parts of radiology and influenced students not to enter the specialty. No significant differences were identified to explain why women do not choose radiology but men do. However, competition for a residency position was cited as important by

TABLE 3: Factors Considered Most Important in Choice of Specialty Stratified by Sex and Career Choice (*n* = 286)

	Men				Women			
	Radiology (*n* = 23)		Not Radiology (*n* = 128)		Radiology (*n* = 12)		Not Radiology (*n* = 123)	
Factor	*n*	%	*n*	%	*n*	%	*n*	%
Salary	2	8.7	19	14.8	0	0	6	4.8
Work hours	6	26.1	42	32.8	3	25.0	28	22.8
Job flexibility	7	30.4	41	32.0	6	50.0	51	41.5
Intellectual stimulation	21	91.3	86	67.2	11	91.7	85	69.1
Use of emerging technology	9	39.1	14	10.9	5	41.7	12	9.8
Patient contact and effect on their lives	1	4.3	92	71.9	1	8.3	103	83.7
Recommendation of mentor or colleague	5	21.7	18	14.1	0	0	11	8.9
Perceived job satisfaction of physicians in specialty	16	69.6	66	51.6	7	58.3	63	51.2
Job availability	2	8.7	10	7.8	2	16.7	11	8.9
Competitiveness of residency	0	0	5	3.9	0	0	6	4.8

TABLE 4: Factors Considered Most Important in Deciding Not to Consider Radiology as a Career (*n* = 169)

	Men				Women			
	Specialty Chosen (*n* = 55)		Undecided (*n* = 7)		Specialty Chosen (*n* = 76)		Undecided (*n* = 21)	
Factor	*n*	%	*n*	%	*n*	%	*n*	%
Physics requirement	16	29.1	2	28.6	22	28.9	7	33.3
Role as consultant physician	25	45.5	4	57.1	25	32.9	5	23.8
Lack of direct patient contact	53	96.4	7	100	72	94.7	19	90.5
Radiation exposure	3	5.5	0	0	6	7.9	3	14.3
Negative perception of radiology by mentor or colleague	5	9.1	0	0	5	6.6	2	9.5
Perceived lack of job satisfaction among radiologists	3	5.5	2	28.6	3	3.9	1	4.8
Lack of job flexibility	6	10.9	2	28.6	2	2.6	1	4.8
Residency process too competitive	12	21.8	2	28.6	22	28.9	7	33.3

Note—Cohort does not equal 169 because 10 respondents did not provide data indicating why they chose not to pursue radiology as a career.

nearly one third of women who responded, compared with one fifth of men. Few students of either sex reported possible radiation exposure as a factor in their decision.

There are few published data on female medical students' perspectives on factors that influence residency choice. In a 1990 study involving 346 medical students from nine U.S. medical schools, Schwartz et al. [4] found that students were most inclined to select careers that had fewer numbers of practice work hours per week, allowed adequate time for pursuit of recreational activities, and seemed to have a smaller number of on-call nights. These factors were more important than prestige, salary, or years of postgraduate training. Job flexibility was reported by a minority of our respondents as important in deciding on a career. In 2003, Dorsey et al. [5] reported survey results obtained from a large group of matriculating medical students. Those authors found that a controllable lifestyle, including defined time on and off the job, accounted for the increased number of applicants to radiology and anesthesiology residencies. In neither of the studies was the sex of the applicants specifically addressed.

In 2003, the most popular specialties among 58,138 male resident physicians on duty in programs accredited by the Accreditation Council for Graduate Medical Education were internal medicine (21.8%), general surgery (9.9%), and family medicine (8.1%) [6]. For 39,947 female resident physicians, the corresponding specialties were internal medicine (22.0%), pediatrics (13.3%), and family medicine (12.2%) [6]. There were 4,044 radiology residents, and 26.8% members of that group were women. Compared with 1993 [7], in 2003 more women worked as residents in family medicine, internal medicine, and general surgery; fewer women were working in anesthesiology and pathology; and there were fewer radiology residents of either sex. These facts correlate with the results of our survey. Both male and female medical students gravitate to specialties in which a considerable amount of direct patient care is provided.

A potential limitation of this study was population bias. Because more than 50% of the sample was taken from the cohort of medical students who had taken an elective radiology clerkship, it is likely that opinions of students who had never considered radiology were underrepresented in our results. Important factors in dissuading a student from a career in radiology may have been overlooked. We believed it important, however, to maximize data obtained from potential radiologists. In retrospect, both portions of the survey probably should have included years of postgraduate training as a factor in deciding on specialty training, particularly because of the debt load many students carry. This factor was not included because it was not mentioned in any of the informal discussions with medical students and colleagues that were used to devise the survey. Years of postgraduate training also are unlikely to be an important factor for many medical students, because during the past decade, applications for 5-year residency positions in general surgery have increased [3].

Because both men and women cited perceived lack of patient contact as the most important factor in not choosing radiology as a career, early exposure to radiologists who work with patients every day, including interventionalists, mammographers, and pediatric specialists should be encouraged. It also may be time to change the emphasis from patient contact to patient impact. It is a rare patient who does not undergo an imaging examination for diagnosis. During all ward rotations, the importance of radiology

to accuracy and efficiency of patient care should be emphasized.

The reality is that radiology is a competitive specialty. Hundreds of applications are received for the few coveted training positions offered each year. Results of recent studies [8] suggest that women are more likely than men to eschew competitive situations. Still, there is no reason that women should be any less competitive than men for the available positions. Mentors counseling women to consider radiology as a specialty should help qualified candidates to overcome their reservations about risk of failure. Both staff and residents should be encouraged to discuss the field with female medical students to emphasize that radiology is an attainable and satisfying career.

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