Editorial

A Paucity of Women Among Residents, Faculty, and Chairpersons in Orthopaedic Surgery

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Although there have been substantial improvements toward achieving gender parity in academic medicine over the past decades, women are not represented equally in academic medicine [2, 6, 7, 14]. In 2005–2006, women represented 49% of graduating medical students, 42% of housestaff, 29% of medical faculty, and 16% of full-time professors [8]. However, even at the level of residents, surgical subspecialties continue to substantially lag behind nonsurgical fields in attaining greater proportions of women: ophthalmology (35.8% women), general surgery (28%), otolaryngology (25.2%), urology (18.7%), neurosurgery (10.9%), orthopaedic surgery (10.9%), and thoracic surgery (10.7%) [8]. What remains unclear is whether the gender of the department chair or residency program director influences the gender balance in academic departments. In a recent study, Cheng et al. [5] found emergency medicine

departments led by women had higher proportions of female faculty and a greater likelihood of having a female residency program director (RPD). However, a survey of radiology departments found, despite a comparatively low proportion of female faculty and trainees, programs chaired by men had similar gender compositions compared to those headed by women [11]. Nevertheless, it is uncertain whether such a relationship exists in orthopaedic surgery training programs, where women comprise only 9% of the total faculty and 10% of all residents [8]. We conducted a study to examine whether the gender composition of the departmental leadership was associated with that of faculty and residents.

Using DADOS-Survey [12], we performed a Web-based, prospective survey of 149 RPDs of Accreditation Council for Graduate Medical Education accredited orthopaedic surgery training programs indexed in the Fellowship and Residency Electronic Interactive Database (FREIDA Online) of the American Medical Association [1]. The survey was designed to assess the gender of the department chair, RPD, faculty, and residents with the specific purpose of exploring relationships between department chairperson gender and the gender distribution of faculty and/or residents. We presumed departments led

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by men had a higher proportion of male faculty and residents compared to departments led by women.

A total of 151 orthopaedic surgery residency programs were listed in the FRIEDA Online directory as of July 1, 2007 [1]; we were able to locate e-mail addresses for all but two programs. The survey was sent to the RPD on July 9, 2007. When the contact information for the RPD was unavailable, the survey was e-mailed to the program coordinator. The survey was accessed a total of 93 times, and we received 76 responses. More responses were received from programs in the Midwest (32%) than other regions, and most programs described themselves as being either academic (59%) or university-affiliated (29%) (Table 1). There was a total of 23 ± 23 (mean $\pm$ standard deviation) faculty members in each department ($n = 1700$), of which 2 ± 3 were female ($n = 164$). Fifteen (20%) of the programs reported no female faculty members. All (74 of 74, 100%) programs were headed by men; two programs did not provide information regarding the gender of their chairperson. The majority of programs had a male RPD (97%). We observed no association between gender and practice type or region. There were 22 ± 9 residents in each department ($n = 1653$), of which 2 ± 2 were female ($n = 182$). Similar to the findings with faculty members, fifteen (20%) departments reported no female residents. We found no association between the gender composition of faculty and that of residents. Because orthopaedic surgery residency departments vary considerably in size, we calculated proportions to examine the representation of women. Females comprised $9\% \pm 8\%$ of all faculty and $10\% \pm 7\%$ of all residents. Due to the small number of female leaders (no chairpersons, two RPDs), we were unable to compare the gender characteristics of orthopaedic surgery residency programs led by women with those led by men.

Our findings suggest gender diversity remains an elusive goal for orthopaedic surgery. Of all primary surgical specialties, orthopaedic surgery has experienced arguably the most marginal improvement in female diversity [4]. While the percentage of women completing medical school increased by 38% between 1970 and 2005 [8], the proportion of women comprising orthopaedic surgery residents only increased by 10.3% during the same time frame [8]. In fact, only 0.6% of all female medical school graduates enter an orthopaedic surgery residency, an annual recruitment rate that has not changed substantially in the past 20 years [4]. The reasons for the low success in attracting women to orthopaedic surgery are a topic of debate. It is possible generalized misconceptions of what the field encompasses deter female medical students from developing an interest in orthopaedic surgery [9, 13]. Furthermore, a lack of exposure during third-year medical school clerkship rotations, and therefore lack of opportunity to better understand

Table 1. Responses to survey questions

Variable	Frequency
Region	
Midwest	24/76 (31.6%)
Northeast	21/76 (27.6%)
South	18/76 (23.7%)
West	13/76 (17.1%)
Description of orthopaedic surgery program	
Academic	45/76 (59.2%)
University-affiliated	22/76 (29.0%)
Community	8/76 (10.5%)
Military	1/76 (1.3%)
Gender of the orthopaedic surgery department chairperson	
Male	74/74 (100%)
Gender of the orthopaedic surgery residency program director	
Female	2/76 (2.6%)
Male	74/76 (97.4%)
Number of total faculty members in the orthopaedic surgery department* ($n = 1700$; mean $\pm$ SD, 23 ± 23 ; range, 4–172)	
0–20	51/76 (67.1%)
21–40	18/76 (23.7%)
> 40	7/76 (9.2%)
Number of female faculty members in the orthopaedic surgery department* ($n = 164$; mean $\pm$ SD, 2 ± 3 ; range, 0–20)	
0–5	72/76 (94.8%)
6–10	2/76 (2.6%)
> 10	2/76 (2.6%)
Number of total residents in the orthopaedic surgery housestaff (excluding fellows)* ($n = 1653$; mean $\pm$ SD, 22 ± 9 ; range, 10–60)	
0–20	45/76 (59.2%)
21–40	27/76 (35.5%)
> 40	4/76 (5.3%)
Number of female residents in the orthopaedic surgery housestaff (excluding fellows)* ($n = 182$; mean $\pm$ SD, 2 ± 2 ; range, 0–14)	
0–5	70/76 (92.1%)
6–10	5/76 (6.6%)
> 10	1/76 (1.3%)

* Survey participants were only able to provide a numerical response with respect to the number of total and female faculty and residents in their program; the total, mean $\pm$ SD, and range are reported for all programs that responded, along with categories designed after the study to demonstrate the distribution of values; SD = standard deviation.

the field and identify potential faculty mentors, may be a factor preventing female students from pursuing a career in orthopaedics.

The small number of females represented in the survey responses limits the conclusions of this study. It should be noted we were unable to obtain data concerning the number of female applicants to orthopaedic surgery or

their acceptance rates. Future studies should focus on medical students and the factors that influence their career-related decisions. As has been suggested by various authors in the past [3, 9, 10], we firmly believe active recruitment efforts beginning early in medical school are crucial to enhancing students' interest and recruiting women to orthopaedic surgery. Many medical schools invite faculty from different specialty fields to lecture students and assist in minimizing the gap between the basic science curriculum and clinical applications, such as lectures delivered by orthopaedists during the first-year anatomy course. Those lecture opportunities, as well as surgery interest groups, provide valuable means through which orthopaedists can dispel misconceptions and stereotypes about orthopaedic surgery (including those propagated by well-intentioned mentors), while encouraging women to consider a career in the field. We believe orthopaedic leaders should promote a more flexible third-year medical school clerkship schedule that allows for exploration of electives and mentors in different surgical subspecialties, such as orthopaedics. These broad changes in conjunction with individually tailored mentorship, increased exposure, and the debunking of historical myths regarding orthopaedic surgery may prove to be a powerful combination in attracting talented women to be effective leaders in the future of orthopaedic surgery.

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