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Comparison of Women in Department Leadership in Obstetrics and Gynecology With Other Specialties

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Abstract

Objective—To compare the representation of women in Obstetrics and Gynecology department-based leadership to other clinical specialties, while accounting for proportions of women in historical residency cohorts.

Methods—This was a cross-sectional observational study. The gender of department-based leaders (chair, vice chair, division director) and residency program directors was determined from websites of 950 academic departments of Anesthesiology, Diagnostic Radiology, General Surgery, Internal Medicine, Neurology, Obstetrics and Gynecology, Pathology, Pediatrics, and Psychiatry. Each specialty's representation ratio—proportion of leadership roles held by women in 2013 divided by proportion of residents in 1990 who were women—and 95% confidence interval (CI) were calculated. A ratio of one indicates proportionate representation.

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Results—Women were significantly under-represented among chairs for all specialties (ratios 0.60, $P = 0.02$) and division directors for all specialties except Anesthesiology (ratio: 1.13, 95% CI: 0.87–1.46) and Diagnostic Radiology (ratio: 0.97, 95% CI: 0.81–1.16). The representation ratio for vice chair was below 1.0 for all specialties except Anesthesiology; this finding reached statistical significance only for Pathology, Pediatrics, and Psychiatry. Women were significantly over-represented as residency program directors in General Surgery, Anesthesiology, Obstetrics and Gynecology, and Pediatrics (ratios >1.19 , $P = 0.046$). Obstetrics and Gynecology and Pediatrics had the highest proportions of residents in 1990 and department leaders in 2013 who were women.

Conclusion—Despite having the largest proportion of leaders who were women, representation ratios demonstrate Obstetrics and Gynecology is behind other specialties in progression of women to departmental leadership. Women's over-representation as residency program directors raises concern because education-based academic tracks may not lead to major leadership roles.

Introduction

Across specialties, the representation of women in academic department leadership roles is lower than the representation of men (1-7). There are nearly equal numbers of women and men among medical school students and residents, and although women comprise 38% of faculty, only 15% of department chairs and 24% of division directors are women (1,8). Faculty representation of women ranges from 22% in General Surgery to 57% in Obstetrics and Gynecology, while the proportion of women who were department chairs in 2013 ranged from 1.4% for General Surgery to 22% for Obstetrics and Gynecology (1). However, since 1993, more women than men have entered Obstetrics and Gynecology, whereas the proportion of women entering General Surgery remains under 38% (1,9).

Accounting for representation of women in historical residency cohorts allows a meaningful comparison of each specialty's advancement of women. Studies comparing historical cohorts of Obstetrics and Gynecology residents to subsequent cohorts of leaders have noted gender disparities (2,3). We hypothesized that these gender disparities persist across medical specialties.

To adequately evaluate women's representation in leadership positions, the cohort of physicians who have been in practice long enough to advance to leadership roles must be examined. If women and men attained leadership positions at similar rates, the gender distribution of current leaders should match that of the historical residency cohort. The objective of this study was to compare the representation of women in academic department-based leadership roles in nine clinical specialties, while accounting for gender differences in historical residency cohorts.

Materials and Methods

This was a cross-sectional observational study of U.S. academic departments of Anesthesiology, Diagnostic Radiology, General Surgery, Internal Medicine, Neurology, Obstetrics and Gynecology, Pathology, Pediatrics, and Psychiatry. We defined academic departments as those whose residency programs were accredited in the 2012-2013 academic

year and were categorized as university hospital-based by the American Medical Association's FREIDA Online database (10,11). The institutional review board at Beth Israel Deaconess Medical Center approved this project.

The methods of this study are described in detail elsewhere (3). Briefly, we searched each department's website from November 2012 through October 2013 to determine the gender of the individuals in each of three major leadership roles (department chair, vice chair, division director) and one educational leadership role (residency program director). We also searched faculty biographies and conducted web searches, when needed. We determined the gender of each leader using names, and when available, we confirmed the gender with pronoun use and images from the department websites.

The number and percentage of women in the 1990 residency cohorts for each specialty were determined using data provided by the Association of American Medical Colleges. The year 1990 was chosen for the historical residency cohort because it was the most distant year that had data available for both the number and percent of women who were residents in each specialty. We assumed that 23 years is sufficient time for faculty members to advance to career positions from which promotion to leadership positions is common (12,13).

We calculated the representation ratio, which was defined as the proportion of department-based leaders in each role (chair, vice chair, division director, residency program director) in 2013 who were women, divided by the proportion of residents in 1990 who were women. In addition to calculating the representation ratio for each role individually, we calculated the representation ratio for all major department leadership roles combined (chair, vice chair, division director) to provide a meaningful summary measure of the representation of women in major department leadership roles.

We used the representation ratio to directly compare specialties because this ratio accounts for the gender distribution differences in historical residency cohorts. A representation ratio of one indicates proportionate representation of women in leadership in 2013 relative to their representation in the 1990 residency cohort, while a representation ratio less than one indicates under-representation of women. For example, a specialty with 25% women chairs and 25% women residents in the historical residency cohort would have a representation ratio of 1.0, indicating proportional representation of women. In contrast, a specialty with 30% women in chair roles and 40% women residents in the 1990 residency cohort would have a representation ratio of 0.75, indicating that women are under-represented in leadership roles.

Study data were collected and managed using Research Electronic Data Capture, a secure, web-based electronic data capture tool. All statistical analyses were performed using Stata 12 (StataCorp, College Station, TX) and GraphPad Prism 6.00 for Windows (GraphPad Software, La Jolla, CA). All tests were two sided, and *P* values <0.05 were considered statistically significant. Categorical variables are presented as the frequency and proportion and were compared using the chi-square or Fisher's exact test. The representation ratio of the proportion of women leaders relative to the proportion of women residents in the historical

cohort is presented with 95% confidence intervals (CI), which were calculated by treating the representation ratio as a risk ratio.

Results

Of the 950 U.S. academic clinical departments listed by the Accreditation Council for Graduate Medical Education in 2012-2013 for these nine specialties, 948 (99.8%) had websites with information about at least one of the leadership roles. The number of departments with leadership information available for at least three roles was 84 in Anesthesiology (85.7%), 94 in Diagnostic Radiology (91.3%), 101 in General Surgery (94.4%), 121 in Internal Medicine (93.8%), 91 in Neurology (91.9%), 105 in Obstetrics and Gynecology (94.6%), 81 in Pathology (82.7%), 93 in Pediatrics (93.0%), and 81 in Psychiatry (78.6%). A total of 7,250 faculty leaders were identified.

In all nine specialties, there were more men than women in the major department-based leadership roles of chair, vice chair, and division director. Overall, women comprised 13.9% of department chairs, 22.6% of vice chairs, 21.6% of division directors, and 39.0% of residency program directors. Obstetrics and Gynecology had the highest proportion of department chairs (24.1%) and vice chairs (38.8%) that were women. Pediatrics had the highest proportion of division directors (31.5%) and residency program directors (64.6%) that were women. Table 1 shows the proportion of leaders who were women for each leadership role in the nine clinical specialties in 2012-2013. In the 1990 historical residency cohort, the proportion of women was highest in Pediatrics (54.3%) and Obstetrics and Gynecology (46.9%). Figure 1 illustrates the proportion of residents who were women in 1990 in the nine clinical specialties.

The representation ratios, which account for the proportion of women entering each field, demonstrated that women were significantly under-represented among department chairs for all specialties (all ratios 0.60; all P 0.02). The highest representation ratio of women in the department chair role was in Diagnostic Radiology (0.60, 95% CI: 0.38–0.95). While the vice chair representation ratios were below 1.0 for all specialties except Anesthesiology, many of the confidence intervals were rather wide, and this finding did not reach statistical significance for several specialties. In the division director role, women were significantly under-represented in all specialties except Anesthesiology (ratio: 1.13, 95% CI: 0.87–1.46) and Diagnostic Radiology (ratio: 0.97, 95% CI: 0.81–1.16; all other representation ratios 0.63; all P 0.001). Table 2 and Figures 2a-2c show the representation ratios for each specialty in each major department-based leadership role.

When examining the representation of women for all three major department-based leadership roles combined (chair, vice chair, division director), the two specialties with the highest representation ratios were Anesthesiology (0.96, 95% CI: 0.79–1.16) and Diagnostic Radiology (0.87, 95% CI: 0.75–1.02). Women were significantly under-represented in Neurology, Psychiatry, Pathology, Pediatrics, Internal Medicine, General Surgery, and Obstetrics and Gynecology when combining the major department-based leadership roles (all representation ratios 0.61; all P 0.001). Table 2 and Figure 3 show the representation ratio of women in major department-based leadership roles for each specialty.

General Surgery had the highest representation ratio of women in the residency program director role (1.55, 95% CI: 1.08–2.21). Across specialties, women were significantly over-represented among residency program directors in General Surgery, Anesthesiology, Obstetrics and Gynecology, and Pediatrics (all representation ratios 1.19; all $P = 0.046$). Women were not significantly under-represented in the residency program director role in any of the nine specialties. Table 2 and Figure 2d show the representation ratios for the residency program director role in each specialty. When evaluating department chairs from all specialties combined, significantly more women than men were also residency program directors (16.9% vs. 8.0%, $P=0.004$).

Discussion

This study used an innovative representation ratio to meaningfully compare proportions of women leaders and demonstrated that across nine major clinical specialties, women were not represented in the proportions in which they entered their fields. It is notable that both Obstetrics and Gynecology and Pediatrics, specialties with the highest proportions of department-based leaders who were women, did not fare better when comparing representation ratios. Both specialties also had the highest proportions of residents in 1990 that were women, and representation ratios were calculated to account for historical residency cohorts. The fact that Obstetrics and Gynecology is similar to General Surgery and Internal Medicine in promoting women to department-based leadership may be contrary to common perceptions of advancement of women as leaders in Obstetrics and Gynecology.

Though women were over-represented in the residency program director role in four specialties, with the highest representation ratio in General Surgery, this finding may not be cause for celebration. Many medical schools now have clinician-educator faculty tracks, which may not lead to major department-based leadership roles at the same rates as research-based tracks (14–16). Occupational interest in roles that are traditionally associated with certain genders, as teaching is for women, may lead to more women than men choosing educational tracks in academic medicine (17).

The finding of greater gender parity in leadership in Anesthesiology and Diagnostic Radiology was unexpected. Anesthesiology and Diagnostic Radiology have been described as “controllable lifestyle” specialties because work hours may be more predictable and may impinge less on personal time; they also have higher-than-average incomes (18,19). While controllable lifestyles should benefit both men and women, it is possible that advantages disproportionately benefit women's advancement because women typically assume greater responsibilities at home. The dual advantage of controllable lifestyle and higher income, allowing more flexibility to pay for support for home responsibilities, may give women in Anesthesiology and Diagnostic Radiology greater ability to devote time and mental energy to career advancement.

Many theories address why women continue to be under-represented in leadership in academic medicine. Women are more likely to assume “institutional housekeeping” tasks—roles that, while critical to sustaining the organization, may not help them advance as leaders (20). Women in research-based tracks start with less funding than men (21). Male faculty at

medical schools are more highly compensated than their female colleagues, and when this difference increases with seniority, women may choose to leave academic medicine (22). There may be unconscious gender bias that results in a lack of mentoring and networking for women, organizational cultures or institutional supports that differentially affect women and men, and a slower initial rate of publication among women (23-29). However, one would expect these issues to impede women's advancement equally across specialties; thus, there may be lessons to learn from the successes in Anesthesiology and Diagnostic Radiology.

Limitations of this study are that we relied exclusively on information that could be obtained online, which may not be accurate or current. However, our results were nearly identical to overall proportions published by the Association of American Medical Colleges (1), suggesting the methodology was sound. In our analysis, we assumed women and men were equally likely to choose academic paths following residency in 1990 and therefore should be equally likely to advance to departmental leadership positions, but gender bias contributing to those early career decisions could affect our results. We also could not account for choice of academic track, such as clinician-educator or investigator; clinical expertise; research productivity; experience; or personal strengths—all of which may influence attainment of leadership roles. Our choice of resident cohort was another potential limitation. However, even if it does not take 23 years to attain all leadership roles, our choice was conservative. Given the proportion of women residents has increased for all specialties, a more recent cohort would yield even lower representation ratios (1,9).

The culture of academic medicine is quite different today than in 1990, when there was far less emphasis on support for women and families. Maternity leaves during residency training increased after 2011 duty hour reforms (30). A renewed emphasis on enhancing the culture of academic medicine benefits all faculty and trainees, though women and under-represented minorities appear to benefit the most (24,25). Analyzing representation ratio trends over time may elucidate trends and better determine which changes are supportive. Future improvement efforts also should include overt recognition that striving for diversity in leadership in medicine is good for all.

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Figure 1. Representation of women in the 1990 residency cohort

Figure 2.

Representation of women in the roles of chair (A), vice chair (B), division director (C), and residency program director (D). Representation ratios are calculated as the proportion of department-based leadership roles held by women in 2013 divided by the proportion of residents in 1990 who were women, where representation ratios <1.0 indicate underrepresentation of women.

Figure 3.

Representation of women in major department-based leadership roles (chair, vice chair, and division director). Representation ratios are calculated as the proportion of major department-based leadership roles held by women in 2013 divided by the proportion of residents in 1990 who were women, where representation ratios <1.0 indicate underrepresentation of women.

Table 1
Proportion of leaders who are women for nine clinical specialties

Specialty	Major Department Leadersn (%)	Chairn (%)	Vice Chairn (%)	Division Directorn (%)	Residency Program Directorn (%)
Anesthesiology n=548	93 (20.9%)	11 (11.1%)	37 (23.0%)	45 (24.5%)	31 (29.8%)
Diagnostic Radiology n=736	142 (22.7%)	16 (15.5%)	30 (22.2%)	96 (24.8%)	35 (31.5%)
General Surgery n=1,003	74 (8.3%)	6 (5.7%)	9 (8.5%)	59 (8.7%)	24 (21.6%)
Internal Medicine n=1,541	240 (17.0%)	11 (9.1%)	59 (23.5%)	170 (16.4%)	37 (27.8%)
Neurology n=509	63 (15.7%)	9 (9.2%)	14 (18.7%)	40 (17.5%)	37 (34.6%)
Obstetrics and Gynecology n=732	188 (30.5%)	27 (24.1%)	38 (38.8%)	123 (30.2%)	71 (61.7%)
Pathology n=483	79 (20.5%)	18 (18.2%)	17 (16.8%)	44 (23.7%)	39 (40.2%)
Pediatrics n=1,183	327 (30.1%)	21 (22.3%)	29 (25.2%)	277 (31.5%)	62 (64.6%)
Psychiatry n=515	90 (21.8%)	11 (10.6%)	39 (24.2%)	40 (27.2%)	45 (43.7%)
Overall n=7,250	1,296 (20.7%)	130 (13.9%)	272 (22.6%)	894 (21.6%)	381 (39.0%)

Table 2

Representation ratios for nine clinical specialties; representation ratios are calculated as the proportion of department-based leadership roles held by women in 2013 divided by the proportion of residents in 1990 who were women, where representation ratios <1.0 indicate under-representation of women

Specialty	Major Department Leaders RR (95% CI)	Chair RR (95% CI)	Vice Chair RR (95% CI)	Division Director RR (95% CI)	Residency Program Director RR (95% CI)
Anesthesiology n=548	0.96 (0.79–1.16)	0.50 (0.29–0.88)	1.06 (0.79–1.41)	1.13 (0.87–1.46)	1.38 (1.02–1.86)
Diagnostic Radiology n=736	0.87 (0.75–1.02)	0.60 (0.38–0.95)	0.87 (0.63–1.20)	0.97 (0.81–1.16)	1.25 (0.94–1.65)
General Surgery n=1,003	0.56 (0.45–0.70)	0.40 (0.18–0.88)	0.60 (0.32–1.12)	0.59 (0.46–0.76)	1.55 (1.08–2.21)
Internal Medicine n=1,541	0.56 (0.50–0.63)	0.31 (0.18–0.54)	0.80 (0.64–1.00)	0.55 (0.48–0.63)	0.95 (0.72–1.25)
Neurology n=509	0.47 (0.37–0.60)	0.32 (0.17–0.59)	0.66 (0.41–1.08)	0.59 (0.43–0.79)	1.29 (0.98–1.70)
Obstetrics and Gynecology n=732	0.61 (0.54–0.69)	0.51 (0.36–0.71)	0.82 (0.64–1.06)	0.62 (0.53–0.72)	1.33 (1.15–1.54)
Pathology n=483	0.49 (0.40–0.60)	0.46 (0.30–0.70)	0.43 (0.27–0.66)	0.59 (0.46–0.77)	1.04 (0.81–1.34)
Pediatrics n=1,183	0.51 (0.46–0.55)	0.41 (0.28–0.59)	0.46 (0.34–0.63)	0.54 (0.49–0.60)	1.19 (1.03–1.39)
Psychiatry n=515	0.49 (0.40–0.59)	0.24 (0.14–0.42)	0.56 (0.42–0.73)	0.63 (0.48–0.82)	1.02 (0.82–1.27)
Overall n=7,250	0.62 (0.59–0.65)	0.43 (0.37–0.50)	0.70 (0.63–0.80)	0.66 (0.62–0.70)	1.22 (1.13–1.32)

RR, representation ratio; CI, confidence interval