



Original Research

Gender and race trends in academic rank of dermatologists at top U.S. institutions: A cross-sectional study



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ABSTRACT

Background: Despite growth in the proportion of women and underrepresented minorities in the dermatology workforce, gender and racial differences persist.

Objective: This study sought to analyze the differences in academic rank between genders and races while controlling for achievement indicators.

Methods: Data from 15 institutions, selected based on residency program rankings, were analyzed.

Results: Women were well-represented as assistant professors (60.7% vs. 37.6% of men; $p < .001$) and underrepresented as full professors (17.0% vs. 37.6%; $p < .001$). However, in a multivariable analysis controlling for career duration, publications per year, National Institutes of Health funding, and PhD degrees, neither gender (adjusted odds ratio [aOR]: 1.01; confidence interval [CI], 0.55–2.73) nor race (aOR: 1.24; CI, 0.53–2.92) was associated with a higher academic rank. Career duration (aOR: 1.24; CI, 1.18–1.30), publications per year (aOR: 1.48; CI, 1.28–1.74), and National Institutes of Health research funding (aOR: 4.29; CI, 1.53–12.88) were predictive of higher academic rank.

Conclusion: Our findings confirm that for equal levels of achievement, men and women are promoted similarly in dermatology, yet reasons for disparity in research output and funding for women and minority dermatologists need further study.

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Introduction

Despite an increase in the proportion of women and underrepresented minorities in the dermatology workforce over the last few decades, gender and racial differences persist. Studies have shown inequities in research funding, leadership and speaking opportunities, journal editorial boards, and compensation (Bendels et al., 2018; Flaten et al., 2019; Lobl et al., 2020; Wu and Lipner, 2019). In January 2020, the Association of American Medical Colleges put out a call to action on gender equality in medicine, noting gender parity at the instructor level but that the percentage of female faculty declines with each subsequent higher rank across the fields of medicine (Association of American Medical Colleges, 2020). This study sought to analyze gender and racial differences in the academic rank of dermatologists while controlling for other achievement indicators.

Methods

We analyzed data from 15 academic medical departments in the United States: Case Western Reserve University, Emory University, Harvard University, Icahn School of Medicine at Mount Sinai, Northwestern University, New York University, Stanford University, University of California, San Francisco, University of Miami, University of Michigan, University of Texas Southwestern, Wake Forest University, Washington University of St. Louis, Weill Cornell Medical College, and Yale University. These programs were selected based on their inclusion in a ranking of the top 20 dermatology residency programs based on academic achievement and accessible faculty information online (Namavar et al., 2018). Professional information, including academic title, medical school graduation year, and additional postgraduate degrees (i.e., PhD, MBA, JD), was obtained from departmental websites.

The number of publications was recorded based on a PubMed search of a physician's name and institution or directly obtained if an individual's curriculum vitae was available on the departmental website. Gender and race data were acquired from Redi-Data (<https://redidata.com/healthcare-lists/>). Physicians were included

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in the minority group if their race/ethnicity was reported as American Indian/Alaska Native, Native Hawaiian, Pacific Islander, Asian, Hispanic, or African American. The National Institutes of Health (NIH) Research Portfolio Online Reporting Tools were used to analyze research funding (<https://report.nih.gov>) for individual physicians over their careers and for the dermatology department for fiscal year 2019.

All statistical analyses were conducted using R Studio software. Continuous variables were expressed as medians and interquartile ranges or means with standard deviations where appropriate. The Mann-Whitney test was used to compare means. Categorical variables were compared with Fisher's exact tests. Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated to analyze the impact of gender and race on promotion, and adjusted for career duration, publications per year, NIH funding, and PhD degrees by calculating a regression analysis. A *p*-value of <.05 was considered significant.

Results

The study population consisted of 384 physicians, of whom 53.6% were female and 46.4% were male (*p* = .046; Table 1). Women were well represented as assistant professors (60.7% vs 37.6% of men; *p* < .001) and underrepresented as professors (17.0% vs 37.6%; *p* < .001; Table 1). There were more minority women than minority men (38.3% vs 29.8%; *p* = .04). Women published less per year practicing (median: 1.52 vs 2.37) and were less likely to receive NIH funding (13.6% vs 32.6%; *p* < .001) compared

with men. In total, 24.7% of the dermatologists sampled had PhD degrees; this did not statistically differ by gender.

White physicians were more likely than nonwhite physicians to be professors (31.7% vs 16.7%, *p* < .01). Black dermatologists had fewer publications per year practicing (median: 1.12 vs 1.76) and were less likely to have received NIH funding (0% vs 22.2%) than white dermatologists, but neither reached statistical significance, likely due to the small sample size of black dermatologists (*n* = 8). Table 2 highlights the correlation of the combination of sex and minority status on academic rank. White men were more likely than nonwhite men (*p* < .01), white women (*p* < .001), and non-white women (*p* < .001) to be full professors.

Men and white physicians averaged longer careers; thus, promotions were compared by 5-year MD graduation cohort. There was no difference in the rates of men and women promoted by group. In a multivariable analysis controlling for career duration, publications per year, NIH funding, and degrees, neither gender (adjusted OR [aOR]: 1.01; CI, 0.55–2.73) nor race (aOR: 1.24; CI, 0.53–2.92) was associated with higher academic position. Career duration (aOR: 1.24; CI, 1.18–1.30), publications per year (aOR: 1.48; CI, 1.28–1.74), and funding (aOR: 4.29; CI, 1.53–12.88) were predictive of a higher rank.

Discussion

Our findings indicate that academic dermatology promotions at these 15 institutions are correlated with career duration and research productivity (number of publications per year and NIH

Table 1
Comparison of demographics, scholarly work, and research funding between male and female physicians from a sample of 15 academic dermatology departments.*

Category	All, n (%)	Men, n (%)	Women, n (%)	<i>p</i> -value
No. of physicians	384 (100)	178 (46.4)	206 (53.6)	.05
Race				
White	252 (65.6)	125 (70.2)	127 (61.7)	.09
Asian	93 (24.2)	43 (24.2)	50 (24.3)	.99
Hispanic	31 (8.1)	9 (5.1)	22 (10.7)	.02
Black	8 (2.1)	1 (0.6)	7 (3.4)	.07
Position				
Professor	102 (26.6)	67 (37.6)	35 (17.0)	<.001
Associate	90 (23.4)	44 (24.7)	46 (22.3)	.63
Assistant	192 (50.0)	67 (37.6)	125 (60.7)	<.001
Other degrees				
PhD	95 (24.7)	48 (27.0)	47 (22.8)	.41
MPH	15 (3.9)	6 (3.4)	9 (4.4)	.79
MBA	3 (0.8)	2 (1.1)	1 (0.5)	.6
JD	1 (0.3)	1 (0.6)	0 (0.0)	.46
Years since obtaining MD				<.001
Mean ± standard deviation	19.0 ± 11.3	22.4 ± 12.6	16.1 ± 9.2	
Median	16	19	14	
Interquartile range	10–25	12–33	9–19.75	
No. of Publications				<.001
Mean ± standard deviation	60.68 ± 96.49	80.65 ± 109.77	43.46 ± 23	
Median	30	42	23	
Interquartile range	11–65	17–119	9–46	
Publications per year practicing				.02
Mean ± standard deviation	2.70 ± 3.16	3.11 ± 3.59	2.35 ± 2.69	
Median	1.75	2.37	1.52	
Interquartile range	0.71–3.49	0.95–3.92	0.65–3.28	
Physicians who have received an NIH grant	86 (22.4)	58 (32.6)	28 (13.6)	<.001
Department NIH Funding (fiscal year 2019)				
>\$4,000,000 (7 institutions)	209 (54.4)	95 (53.4)	114 (55.3)	.71
<\$4,000,000 (8 institutions)	175 (45.6)	83 (46.6)	92 (44.7)	.71

NIH, National Institutes of Health.

* Departments included from Case Western Reserve University, Emory University, Harvard University, Icahn School of Medicine at Mount Sinai, Northwestern University, New York University, Stanford University, University of California, San Francisco, University of Miami, University of Michigan, University of Texas Southwestern, Wake Forest University, Washington University of St. Louis, Weill Cornell Medical College, and Yale University.

Table 2

Correlation between sex-race combination and academic rank.

	Men		p-value	Women		p-value
	White	Non-White		White	Non-White	
Professor	55 (44.0%)	12 (22.6%)	.01	25 (19.7%)	10 (12.7%)	.25
Associate Professor	28 (22.4%)	16 (30.2%)	.34	31 (24.4%)	15 (19.0%)	.39
Assistant Professor	42 (33.6%)	25 (47.2%)	.09	71 (55.9%)	54 (68.4%)	.08

funding), but not race and gender. These results contrast with a 2014 cross-sectional analysis of U.S. physicians with medical school faculty appointments across specialties, in which women were less likely to be full professors compared with men, even after accounting for age, experience, specialty, number of authored publications, NIH funding, and clinical trial investigation (Jena et al., 2015). In our sample, women and minority dermatologists who achieve seniority have productivity metrics comparable with male and white dermatologists. However, it remains that fewer women and minority dermatologists reach the full professorship rank.

Women and minority dermatologists may be at a disadvantage for promotion within academic departments due to the weight placed on research output as a benchmark for success. The difference found here in the number of publications per year and research funding is consistent with prior research. Zhang et al. (2017) found that women have not achieved parity with men in terms of authorship in the dermatology literature, despite a marked increase in senior female authorship, female first authorship, and federal funding for female senior authors from 1999 to 2009. Cheng et al. (2016) found that only one in three NIH grants and one in four R01 grants awarded to dermatologists go to women. Therefore, if research achievement is to be used as a benchmark for academic promotion, increased efforts are needed to support the research activities of women and minority dermatologists. In addition, recognition should be given to other factors when considering an individual for promotion, such as diversity work; community service; mentorship of students, trainees, and peers; invitations to speak at grand rounds; and other lectures and teaching hours (Okoye, 2020).

The small number of underrepresented minority physicians employed by the institutions queried limited our ability to make statistically meaningful comparisons among various race-gender combinations (i.e., Hispanic women vs. black men). However, the small sample size of minority physicians mirrors the field of dermatology as a whole. Data from 2016 showed that only 3% of all dermatologists were black and 4.2% were Hispanic, making dermatology one of the least ethnically/racially diverse specialties (Pandya et al., 2016). Clearly, recruitment and retainment of minority physicians should be prioritized.

This study is subject to several limitations. The dataset collected represents only a small sample of dermatologists practicing at academic institutions, and the small sample size and type of institution (i.e., largely urban, tertiary care centers) may limit the generalizability of our findings. Additionally, the use of PubMed to search for the number of publications may have skewed our results; the search does not attribute publications to an individual who changed last names, a phenomenon that skews toward female dermatologists.

Conclusions

Our study demonstrates that promotions in academic dermatology at 15 institutions are correlated with career duration, publica-

tion frequency, and research funding. Our findings confirm that, for the indicators of achievement investigated in this study, men and women are promoted similarly in dermatology. Nevertheless, the underlying reasons for differences in research output and funding for women and minority dermatologists must be addressed in future studies incorporating a more comprehensive set of institutions of diverse sizes and geographic regions.

Conflict of Interest

None.

Funding

None.

Study Approval

The author(s) confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies.

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